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RELATIONSHIPS BETWEEN COPING BELIEFS, COPING PRACTICES, AND COPING RESOURCES AND THE QUALITY OF LIFE IN RHEUMATOID ARTHRITIS PATIENTS

by

THOMAS IRVIN STRONG

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY
IN
COUNSELLING PSYCHOLOGY

EDUCATIONAL PSYCHOLOGY

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FALL 1990

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The undersigned certify that they have read, and recommended to the Faculty of Graduate Studies of Research, for acceptance, a thesis entitled RELATIONSHIPS BETWEEN COPING BELIEFS, COPING PRACTICES, COPING RESOURCES AND QUALITY OF LIFE IN RHEUMATOID ARTHRITIS PATIENTS submitted by Thomas Irvin Strong for the degree of DOCTOR OF PHILOSOPHY IN COUNSELLING PSYCHOLOGY.

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Abstract

Coping with rheumatoid arthritis (RA) was hypothesized to involve three dimensions: coping beliefs, coping practices, and coping resources. Measures from each of these dimensions were administered, along with measures of quality of life in RA, to a volunteer sample of 244 Alberta RA patients. Bivariate analysis revealed that measures from each of these dimensions of coping were related to the quality of life measures of physical comfort and functional ability. However, multivariate analyses indicated that linear combinations of measures predictive of physical comfort and functional ability did not include measures from each hypothesized coping dimension. Coping belief measures, in particular the Arthritis Self-Efficacy Scales, were the most predictive of RA quality of life. The results of factor analysis suggested that the measures of coping beliefs and coping practices assess a common dimension of coping. Discriminant analyses successfully classified participants according to high and low scores on the quality of life measures showing that a different combination of coping measures predicts membership in the high and low physical comfort groups from those predicting membership in the high and low functional ability groups. Further discriminant analysis enabled prediction of volunteers into "high active/low passive" or high passive/low active" coping style groups on the basis of their scores on coping and quality of life measures. The implications of these results are discussed as they relate to the treatment of RA patients and to research into coping with chronic illness.

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I was sure until they asked me.
Jane Siberry

Completing this dissertation has helped me to realize the potential of people's caring and cooperation, and as a result, I feel more capable of offering that care and cooperation to others. As well, I learned about expanding my world and my understanding of myself as people helped, in many ways, to challenge the limitations I would have otherwise been destined to carry forth.

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> I was so much older then; I'm younger than that now.
>
> Bob Dylan

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Chapter 1

A. Introduction

A growing body of research suggests that some responses to illness are more effective than others in promoting a satisfactory quality of life. Some patient responses seemingly minimize the disruptions caused by illness. Research indicates that people respond to chronic illness symptoms as they would to other stressors in their lives: they use beliefs which guide the choice and deployment of specific stress-coping practices. These beliefs are, in turn, largely based on perceptions of resources which could be mobilized to counteract these stressors. Which beliefs, practices and resources are called upon to cope with chronic illness symptoms varies with each individual, though some similarities exist. These individual beliefs, practices and resources reflect dimensions of coping which individuals could respond with when faced with a chronic illness. This study assumes that these dimensions are central to chronically ill people's quality of life, influencing the ways their lives are affected by illness.

For rheumatoid arthritis (RA), as well as many other chronic illnesses, treatment focuses on symptom management as opposed to cure. It is the guiding premise of this study that optimal treatment for RA patients involves a collaborative relationship with health-care specialists. Responses of patients to the symptoms of chronic illnesses such as RA, and to their prescribed treatments, are crucial to the success of treatment. Patients cannot avoid exercising some "participatory control" (Reid, 1984) over their symptoms. How they exercise this control is influenced by their coping beliefs, coping practices, and perceived coping resources. For example, effective symptom management can be achieved or negated by patient coping responses in areas such as compliance with prescribed treatment regimens (Belcon, Haynes & Tugwell, 1984)

This study assumes that there is a general repertoire of coping beliefs, coping practices, and coping resources which will most favourably predispose RA patients to a satisfactory quality of life in the areas of physical comfort and functional ability. Using this coping response repertoire, patients could optimally collaborate with health care specialists to minimize the negative effects their symptoms have on their quality of life. This study may contribute toward identifying this repertoire.

B. Statement of the Problem

While an early line of psychological research with RA patients focused on a variety of personality traits which apparently predisposed or influenced the course of RA (e.g. Moos, 1964), a more recent line of research has concentrated on coping variables which are more directly amenable to psychoeducational interventions (Anderson, Bradley, Young, McDaniel & Wise, 1985). This latter line of research has generated, in piecemeal fashion, a growing array of variables which have been shown to correlate with measures of the patient's quality of life. These variables are considered to reflect an individual's capacity to cope with the symptoms of RA, and correlate with differences in how the individual experiences the disease (e.g., Stein,Wallston, Nicassio & Castner,1988). Furthermore, interventions designed to enhance the use of certain of these "coping variables" have resulted in patients' reports of greater satisfaction regarding their quality of life (O'Leary, Shoor, Lorig & Holman, 1988; Parker, Frank, Beck, Smarr, Buescher, Phillips, Smith, Anderson & Waker, 1988). There now is a greater and more complex group of variables hypothesized or found to be making this contribution. Missing from the research to date, however, has been a comprehensive attempt to understand how this recent proliferation of coping variables, or combinations of these variables, collectively and uniquely contribute to the RA patient's quality of life. There is a need to integrate and simplify understandings of those coping factors capable of alleviating or exacerbating a patients' experience of RA so that health care professionals may use these understandings to improve the quality of RA treatment.

The primary focus of the present study is to examine three dimensions of coping variables and the relationships that they have to two crucial areas of quality of life: physical comfort and functional ability. These coping variables have been operationalized to measure constructs characteristic to each of these dimensions: beliefs, (including arthritis self-efficacy, and "helplessness"); practices (consisting of active vs. passive coping styles, treatment compliance and general health behaviours, and alexithymia, a psychodynamic measure of an individual's ability to regulate emotions) ; and resources (in this case, "health-related hardiness", and forms of social support). By measuring and delineating the relationships among measures indicative of these dimensions of "coping" variables and the quality of life measures, this study moves toward integrating and simplifying understandings of how what a patient believes, practices and views as resources affects the experience of RA.

C. Conceptualizations

There are two conceptualizations central to the aims of this study. First, coping is viewed as any response that an individual makes to the symptoms of rheumatoid arthritis, regardless of the effectiveness of the response. This conceptualization is in line with a definition of coping proposed by Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen (1986), "coping is defined simply as a person's efforts to manage demands, whether or not the efforts are successful"

(p. 996). The conceptualization is also consistent with the self-regulatory theory of Nerenz and Leventhal (1983) who wrote, "we view the patient as actively constructing a definition or representation of his or her illness (or stress) episode and basing or regulating his or her behavior in terms of this representation" (p.14). Essential to this conceptualization is the view that coping involves the following dimensions: cognitive processes or beliefs, coping practices, and personal or environmental resources which could be mobilized in efforts to manage the stress of RA. Coping, the first of the two conceptualizations, then, is essentially any response, or set of responses, that the individual makes to RA symptoms.

A second conceptualization guiding this research regards the subjective quality of life experienced by individuals having RA. Quality of life, in the sense used in this study, would be viewed as the degree of subjective well-being reported by people having RA. Seen conversely, it reflects the degree of interference that results from a person's response to RA symptoms. Recent editorials in the two major journals devoted to research in rheumatology underscore the growing acknowledgement of the patient's quality of life in treatment and research (Ehrlich,1988; Meenan and Pincus,1988). This was best stated by Meenan and Pincus (1988), "Patient status can be thought of as a *hierarchy* of 3 major concepts: quality of life, health status and functional status." (p.411, italics added). Quality of life shall therefore be viewed as the subjective sense of well-being an individual reports in the face of the symptoms of illness. For this study, quality of life will be measured for two important symptomatic features of RA, physical comfort and functional ability.

D. Purpose

The major purpose of this study then is to assess the degree of relationship which exists between measures of RA patients' coping, conceptualized as involving belief, practice and resource dimensions, and the patients' quality of life. Questions guiding the research included:

1. Would measures representative of the three coping dimensions predict RA quality of life, and if so, could these measures be reduced to general coping factors consistent with these hypothesized dimensions?

2. What linear combinations of coping measures best predict quality of life in RA patients?

3. Is there a difference in the coping and quality of life measures that predict an active versus passive coping style?

4. Is there a combination of coping and quality of life measures which can be used to differentiate those compliant with treatment from those resistant to treatment?

The present study has the potential of making unique contributions to the existing body of research in this area. Given the design features employed in this study these contributions are anticipated because:

1) this is the first study to evaluate measures of coping beliefs, coping practices, and coping resources as they relate to quality of life measures in RA.

2) a large sample will permit statistical analyses capable of: a) classifying patients into groups according to their scores on the different measures, and b) reducing the numerous variables to fewer explanatory categories.

E. Conclusion

In summary, the basic aim of this study is to identify relationships among RA patients' coping beliefs, coping practices, coping resources, and indices of their quality of life. This study will hopefully bring research closer to answering the following question: "What can people do to best promote their well-being given the fact that they have RA?". This research shall attempt to provide a selective and preliminary integration of the "state of the art" in RA coping research. Should this study accomplish that goal, it will have assisted in providing a more comprehensive account of the role that RA patients' coping capacities can play in optimizing the treatment relationship they have with health care specialists.

Chapter II

Review of the Literature

As an integrative study, the questions to be addressed in this research come from diverse and complex bodies of literature that are, as a whole, very recent. Following a description of the clinical and prognostic features of rheumatoid arthritis (RA), attention shall be turned to quality of life for RA patients, with special emphases on physical comfort and functional ability. The review of literature shall follow with an examination of research on coping with RA, with special emphasis on studies and theories relevant to the belief, practice, and resource coping dimensions. Concluding the review will be an overview of studies of changes in RA quality of life resulting from treatment interventions designed to enhance certain forms of coping.

A. Rheumatoid Arthritis: Clinical and Prognostic Features

Rheumatoid arthritis (RA) is a degenerative disease of the autoimmune system affecting connective or supporting tissues throughout the body (Zuckner, 1986). The term "arthritis" has been used since the days of Hippocrates and literally means joint inflammation. The specific cause of RA has eluded detection (Zvaifler, 1986), though a genetic predisposition is now strongly suspected (Williams & McCarty, 1985). Prevalence rates of RA among the general American public have been estimated at between 0.1% and 7%, depending on the stringency of the criteria utilized (Turner, 1986), but a commonly accepted rate has been estimated at 1% (Anderson et al, 1985; Williams & McCarty, 1985). RA is more common in the elderly and has been estimated to affect women two to three times more often than men, though epidemiologic studies of entire populations show a nearly equal sex ratio in patients with classic disease (Williams & McCarty, 1986).

The American Rheumatism Association has recently adopted new criteria for the diagnosis of RA:

> 1) morning stiffness in and around joints lasting at least 1 hour before maximal improvement; 2) soft tissue swelling (arthritis) of 3 or more joint areas observed by a physician; 3) swelling (arthritis) of the proximal interphalangeal, metacarpholangeal or wrist joints; 4) symmetric swelling (arthritis); 5) rheumatoid nodules; 6) the presence of rheumatoid factor; 7) radiographic erosions and/or periarticular osteopenia in hand and/or wrist joints. Criteria 1 through 4 must have been present for at least 6 weeks. RA is defined by the presence of 4 or more criteria, and no further qualifications (classic, definite, or probable) are required. (Arnett, Edworthy, Bloch, McShane, Fries, Cooper, Healey, Kaplan, Liang, Luthra, Medsger, Mitchell, Neustadt, Pinals, Schaller, Sharp, Wilder & Hunder, 1988).

This revision is a streamlining of earlier classification systems (Ropes, Bennett, Cobb, Jacbox & Jessar, 1958; Steinbrocker, Traeger & Batterman, 1949).

RA is incurable and its specific manifestations are unpredictable (Wiener, 1975). Typically, the small joints of the hand and wrist are the first to be affected by the inflammation and swelling. As this inflammation occurs, physical discomfort results. Zvaifler wrote that the trigger of the initial stages of the illness, a response to a specific etiologic agent, is different from the causes of the progressive inflammation,

> "For whatever reason, the cells and products of the immune system, although probably not primarily involved in the initiation of RA, are certainly largely responsible for the perpetuation of the inflammatory response" (Zvaifler, 1986 p. 561).

A tragic irony of RA has been hypothesized; namely, that its symptoms are a function of the patient's autoimmune system's activity turned against the patient's connective and supporting tissues instead of the normal illness causing agents that this system typically counteracts (Zvaifler, 1986). As the illness progresses, other joints become involved, destruction of cartilage takes place, the swelling can lead to deformity, limitation of movement in the affected joints occurs, rheumatoid nodules may form, joints that hurt only with movement may start to hurt while at rest, muscle waste ensues around affected joints, and physical impairment often results (American Arthritis Foundation, 1983; Anderson et al, 1985; Williams & McCarty, 1985; Zvaifler, 1986). However, these are only the primary symptoms of the disease. Not surprisingly, many RA patients develop reactive symptoms of depression (e.g., Hawley & Wolfe, 1988), erosions of self-esteem (Baum & Figley, 1981), or various forms of psychopathology (Rimon & Laakso, 1984).

The onset of RA is frequently heralded by fatigue, diffuse myalgia, fever, loss of appetite, and vague malaise (Williams & McCarty, 1986). This onset can occur abruptly or in a chronic and insidious manner with apparent corresponding differences in patient prognosis. The prognosis for patients with abrupt onset is more favourable than for those with insidious onset (Zuckner, 1986). Similarly, the onset of RA in elderly patients has been found to be predictive of a better prognosis than for patients who experience an onset of RA at earlier ages (Deal, Meenan, Goldenberg, Anderson, Sack, Pastan & Cohen,1985). A potential link between stressful life events and the abrupt onset of RA (Baker, 1982; Rimon, 1980) has been identified.

The prognosis of RA can be influenced by a variety of factors. Factors predictive of illness course in RA include age, radiologic grade, sex and initial diagnostic severity (Sherrer et al,1986); race, response to therapy, social and economic factors (Zuckner,1986); and level of education (Callahan & Pincus, 1988). Stress appears to play a role as well. From studies of the relationship of stress to the clinical severity of RA in humans and animals, Koehler (1985) concluded that the effects were contradictory; no general conclusions could be drawn but it seemed that certain RA patients perceived life events in such a way as to experience more stress than others. In related research, Flor and her colleagues (Flor, Turk & Birbaumer, 1985) have demonstrated that stress-related cognitions trigger painful muscular spasms in chronic back pain patients. This finding has been supported by research with RA patients (Anderson et al, 1985).

A more direct relationship between stress and illness course has recently been suggested: stress may interact with immunoregulatory functioning (Ader, 1985; Koehler, 1985; Parker & Westra, 1989; Solomon, 1981). A preliminary examination of this interaction in RA patients has identified associations between self-reports of psychological distress and coping practices with alterations in lymphocyte counts (Zautra, Okun, Robinson, Lee, Roth & Emmanuel, 1989). Others have suggested that some of the psychological concomitants of RA, such as depression and beliefs in the uncontrollability of RA symptoms, also act as secondary factors in negatively influencing the progression of the illness (Bradley, 1985; McFarlane, Kalucy & Brooks, 1987). Additionally, failures to adhere to treatment regimens (Belcon et al, 1985), declines in general health practices (Bortz, 1984) and difficulties in primary relationships (Imig & Sensen, 1988; Manne & Zautra, 1989), viewed in the present study as a potential coping resource, can predict a poor prognosis. Good prognostic factors include acute onset, negative rheumatoid factor titres, low levels of functional impairment, absence of rheumatoid nodules, and intermittent episodes of acute disease that are responsive to first line drugs - and coping beliefs, coping practices and coping resources (Anderson et al, 1985; Lorig et al, 1989; Manne & Zautra, 1989).

Conventional treatment approaches for RA patients range from the intake of mild analgesics (usually aspirin or other non-steroidal anti-inflammatory drugs) to injections of gold or penicillamine, or, as a final resort, surgery to correct diseased bones and connective tissue (Lightfoot, 1985). Lightfoot suggested that three realistic goals of treatment would be: relief of symptoms, preservation of joint function, and a reasonable lifestyle" (Lightfoot, 1985, p.669). Often physical therapy that includes the regular practice of exercises designed to maintain joint flexibility and general fitness is prescribed as part of the treatment (Basmajian, 1987). Increasingly, education regarding arthritis and suggestions for self-care are included in treatment (e.g. Lorig, Konkol & Gonzalez, 1987).

There is neither a cure for RA, nor any certainty that the treatments will arrest the progression of the disease. Instead, as Williams and McCarty (1985) posited, "Regardless of the therapy or management offered when individuals are followed as a group, the number doing poorly increases with the length of observation" (p. 618).

Quality of Life in Rheumatoid Arthritis

Inevitably, those affected by RA face challenges to their accustomed lifestyle or, in other words, their quality of life is threatened. 'Quality of life' is a phrase which is current in the literature on arthritis patient health status. Its use reflects a growing appreciation for the totality of the health experience and a recognition that treating illness involves more than the mere management of physical symptoms. Meenan and Pincus (1988) advocated that quality of life is the fundamental indicator of RA patient health status. While traditional patient health status assessment in RA had focused on physical measures of functional ability (Gresham, 1987) in combination with standard medical tests for such factors as rheumatoid titre or Westergren Sedimentation Rate, measures of patients' quality of life have increasingly been used in routine diagnostic procedures (Liang, Cullen & Larson, 1986; Meenan & Pincus, 1988). Such measures provide clinicians with an assessment of the degree to which patients' lives are free of disruptions caused by RA symptoms. In this study, the primary quality of life indices are measures of physical comfort and functional ability. These are the most commonly studied indices of quality of life with the best developed measurement instruments.

Before turning to these specific quality of life factors, one should not overlook the typical disruptions caused by RA. The patient's subjective experience of this disease is perhaps best characterized as a need to adjust to a progression of successive loss experiences. The patient often experiences major psychosocial disruptions in terms of inabilities to maintain vocational (Meenan, Yellin, Henke, Curtis & Epstein, 1978; Reisine, Grady, Goodenow & Fifield, 1989), social (Wiener, 1975), sexual (Baum & Figley, 1981) and homemaking roles (Reisine, Goodenow & Grady, 1987). Families are often rendered dysfunctional by the onset of chronic illness in one of its members (Rolland, 1987). Patients, therefore, respond to both the symptoms of RA and to the life changes created by those symptoms (Liang, Rogers, Larson, Eaton, Murawski, Taylor, Swafford & Schur, 1984).

The costs of these disruptions are often reflected in secondary problems such as psychological maladjustment: depression (estimated at 42% Frank et al 1988), anxiety; loss of self-esteem due to changes in ability, appearance, physical comfort and the abilty to maintain social roles; anger in reaction to increased dependence-independence conflicts, disruptions in lifestyle and functional ability, and pain; and constriction or disintegration of personality (Baum and Figley,1981). However, the relationships between RA and symptoms of psychological maladjustment are not necessarily causal, with some researchers claiming that most of these symptoms are attributable to non-illness factors

(Hawley & Wolfe, 1988; McFarlane & Brooks, 1988). Still, RA patients incur personal, insurance, and social service financial costs which are three times the U.S. national average (Meenan et al, 1978). RA, and its corresponding symptoms, is thus a potential threat to a patient's economic, interpersonal, and subjective sense of well-being. The most immediate threat to an RA patient's quality of life, however, is the chronic threat to physical comfort.

Physical Comfort

The most pervasive and distressing of RA's symptoms is pain. Pain has been called the most universal form of stress encountered by humans, as well as the most common medical symptom (Turk, Meichenbaum & Genest, 1983). RA patients consistently report that physical comfort is their primary objective in seeking medical care (Parker, Frank, Beck, Finan, Walker, Hewett, Broster, Smarr, Smith & Kay, 1988). However, consistent findings in studies of arthritic pain suggest that the degree of physical comfort experienced by patients bears little relation to indices of organic disease activity (Hagglund, Haley, Reveille & Alarcon, 1989; Lichtenberg, Swensen & Skehan, 1986; Parker et al, 1988b; Summers, Haley, Reveille & Alarcon, 1988).

Physical comfort, reflects the degree of freedom one has from pain. The International Association for the Study of Pain has adopted a definition of pain which recognizes that: "a) pain is subjective; b) pain is more complex than an elementary sensory event; c) the experience of pain involves associations between elements of sensory experience and an aversive feeling state; and d) the attribution of meaning to the unpleasant sensory events is an intrinsic part of the experience of pain" (Chapman 1986, p.153). This view of pain reflects important findings that have resulted from research indicating: 1) that pain is both a physical and psychological experience, and 2) there are critical differences between acute and chronic pain. Physical comfort in RA is a subjective experience based on physical and psychological responses to acute and chronic forms of pain.

Theories of pain have evolved from the mechanistic and "objective" view that a certain degree of evoked physical sensation should cause a certain amount of physical pain, to views more suggestive of the role played by psychological factors and the dynamics of the central nervous system (Melzack & Wall, 1965; Price, 1988). The question is no longer whether psychological factors play a role in the pain experience, rather it is one of which psychological factors are involved in pain or physical comfort. There are growing bodies of evidence and theory to suggest that pain is: a) learned behaviour (Craig, 1986; Fordyce, 1986), b) influenced by psychodynamic conflicts (Blumer & Heilbronn, 1982; Engel, 1959; Sriram, Chaturvedi, Gopinath & Shanmugam, 1987); c) culturally influenced (Bates, 1987); d) influenced by family and marital relations (Flor, Kerns & Turk, 1987; Payne & Norfleet, 1987; Sluzki, 1981) and related to e) personality (Craig, 1984); f) cognitive (Eich, Reeves, Jaeger & Graff-Radford, 1985; Lefebvre, 1981; Smith, Follick, Ahern & Adams, 1986; Stoudemire & Sandhu, 1987; Weisenberg, 1984); g) demographic (Crook, Rideout & Brown, 1984), or h) coping variables (Fernandez, 1986; Rosenbaum, 1980; Rosenstiel & Keefe, 1983; Turner & Clancy, 1986).

In studies which have compared psychological factors as they relate to arthritic pain, the consistent finding has been that psychological variables explain the most substantial proportion of the variance in pain scores, when compared with the variance accounted for by illness severity (eg. Parker et al, 1988; Summers et al, 1988). These psychological variables have included measures of psychopathology such as the hypochondriasis scale of the MMPI (Lichtenberg et al, 1986; Lichtenberg et al, 1984); state and trait anxiety, learned resourcefulness, and depression (Summers et al, 1988); subjective stress and interpersonal sensitivity (Parker et al, 1988).

An alternative way of viewing the role of psychological factors is conceptualize them in terms of coping responses and factors. Seen this way, degrees of physical comfort in RA patients have been found to correspond with the quality of interpersonal relationships (Manne & Zautra, 1989), education (Callahn & Pincus, 1988), activity levels (Badley & Papageorgiou, 1989), the practice of certain "pain behaviours" (Anderson, Bradley, McDaniel, Young, Turner, Agudelo, Keefe, Pisko, Snyder & Semble, 1987), self-reports of helplessness beliefs (Stein et al, 1988b) and self-efficacy beliefs (Lorig et al, 1989), and the practice of active and passive coping styles (Brown et Nicassio, 1987). In the present study, these psychological factors are assumed to include patients' coping beliefs, coping practices and coping resources.

The typical medical view and response to all pain problems has, until recently, been based on understandings of acute pain (Bonica, 1979). There are, however, very significant differences in the mechanisms which underlie acute and chronic pain (Wall, 1984). While most normal or acute pain responses are intended as temporary self-healing measures, sustained responses, or pain behaviours, are considered the heart of the chronic pain problem (Phillips, 1987; Wall, 1984) and serve no biological function (Bonica, 1979). These responses could be likened to an airplane's automatic pilot which flies according to prespecified instructions until the pilot makes corrections or reassumes control of the airplane. The present study asssumes that these responses reflect patients' coping efforts.

There are a number of views on the factors involved in promoting and sustaining chronic pain. Some behaviourist psychologists have taken the position that pain is a behavior contingent on environmental reinforcements and not a subjective internal experience (e.g., Rachlin, 1985). Others suggest that: a) chronic pain fulfills an important need in ongoing psychodynamic conflicts (Blumer & Heilbronn, 1982; Engel, 1959); b) it is an externally reinforceable behavior that combines with psychodynamic mechanisms (Wall, 1984); c) it is complicated by iatrogenic problems such as drug dependency or inadequate drug prescription (Melzack, 1986; Phillips, 1988); d) it is a function of muscular waste and resultant stress-related spasms (Flor, Turk & Birbaumer, 1985; Fordyce, 1976); e) that memories of pain exert assimilative effects on perceptions of present pain intensity (Eich, Reeves, Jaeger & Graff-Radford, 1985); and f) there are family and other systemic inducements to remain in the chronic pain patient role (Dym, 1987; Engelbart & Vrancken, 1984; Maruta, Swanson & Swenson,1979). Fields (1987) suggested that chronic pain "has acquired ...a life of its own, sustained by abnormal function of the nervous system." (p.8). Extending this notion into the interpersonal domain, Engelbart and Vrancken (1984) proposed, "Starting from the concept of pain as an intrinsic function, chronic pain can be understood as a state resulting from the derangement in the course of that function." (p.1385) What is most evident about the difference in chronic pain from acute pain is that once the original acute pain has been expressed, intra- and interpersonal factors - conceptualized in the present study as patient beliefs, practices and resources - have the capacity to maintain and exacerbate pain into chronicity.

It would seem reasonable to assume that RA patients' degrees of physical comfort are related to both acute and chronic pain. However, there is only indirect evidence known by the researcher to support this assumption (e.g. Anderson et al, 1987). Studies using longitudinal and other designs should more closely examine the interplay of acute and chronic pain mechanisms in RA patients. The acute pain in RA is related to ongoing inflammation exacerbated by illness "flare-ups". For example, pain is routinely experienced as a by-product of daily morning stiffness (Williams & McCarty, 1985). What makes RA pain, or lack of physical comfort, complicated is its habitual nature and the role it can come to play in the intrapersonal and interpersonal aspects of patients' lives. It is assumed in this study that there is a complex interaction of acute and chronic pain mechanisms in RA, and that both pain mechanisms, or responses, are evident in the habitual coping beliefs, practices and resources of the patients. Statistical analyses in the present study will identify the coping measures which best predict physical comfort and those which best differentiate patients into physically comfortable and physically uncomfortable groups.

Functional Ability

The other quality of life area to be examined in the present study is the RA patient's functional ability. Functional ability refers to the patient's capacity to maintain a normal daily existence despite the symptoms of illness. An RA patient's functional ability can be minimally disrupted by symptoms such as minor morning stiffness or, at another extreme, be crippled by symptoms requiring corrective surgery. As RA progresses, inflammation often leads to swollen, disfigured or impaired joint function (Zvaifler, 1986). Prolonged disease often results in destruction of cartilage, ankylosed or fused joint tissue requiring corrective surgery, and loss of bone mineralization (Anderson et al, 1985). With this progression, patients frequently use maladaptive coping practices to protect their painful and swollen joints, such as by limiting their use of these joints, thereby promoting the atrophy of the muscles used to facilitate movement of those joints (Bortz, 1984).

It is possible for patients to find themselves contributing to a successive degeneration of their capacities to physically function (e.g. Bradley et al, 1987; Felton & Revenson,1989) or, alternatively, maintaining a consistent level of physical functioning. However, a recent study of functional disability in RA patients, conceptualized as "pain behaviour", has provided counter-evidence suggesting that disease activity and disease duration are better predictors of functional ability than measures of pain and certain psychological factors (Anderson, Keefe, Bradley, McDaniel, Young, Turner, Agudelo, Semble & Pisko, 1988). Still, the factors contributing to functional ability in RA patients are complex.

While differences in the degree of functional ability have been noted on the basis of age, radiologic grade, sex and initial functional class (Sherrer, Bloch, Mitchell, Young & Fries, 1986), these have been shown to vary according to self-evaluations, or beliefs, of ability (Blalock, 1987; Smith, Peck, Milano & Ward, 1988) and pain (Bradley et al, 1987; Parker et al, 1988a). Evidence suggests that certain modifiable pain or illness behaviours influence a patient's functional ability (Bradley et al, 1987). Research with other chronic pain patients has clearly identified relationships between the practice of these dysfunction-promoting behaviours and reinforcements in the patient's social context (Flor, Kerns & Turk 1987; Fordyce, 1976; Painter, Seres & Newman, 1980). Therefore, a patient's level of functional ability is influenced by subjective interpretations or beliefs regarding personal abilities, the practice of certain habitual behaviours, and social resources. From the analyses performed in the present study it will be possible to identify coping measures which best predict functional ability and those which most effectively discriminate patients into groups seen as functionally able and functionally disabled.

Coping with Rheumatoid Arthritis

Definition

In the present study, "coping" shall refer to the beliefs, practices and resources used by individuals with RA to protect or improve their quality of life, regardless of the efficacy of those beliefs, practices and resources. Most alternative defintions of coping can either be subsumed in this definition or seem inappropriate when applied to the study of the complexities of coping with RA.

For example, "coping" could be viewed, as one's ongoing efforts to self-regulate biological processes so as to preserve one's organismic integrity in the face of all factors which challenge those processes or integrity (Nerenz & Leventhal, 1983). While such a definition captures the process of biological survival inherent in coping, it overlooks the role that resources may play in facilitating coping. Lazarus & Folkman offered a more comprehensive definition,

> "We define coping as constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person "(Lazarus & Folkman,1984, p.172).

This view of coping encompasses the subjective and dynamic complexity of the interactions between appraisals, resources for coping, and practices used in coping. However, their view overlooks the fact that habitually used efforts are often used to cope, often with unsuccessful outcomes.

Crucial to the view of coping used in this study is that a person's coping responses are essentially subjective in nature. These responses typically appear to be the best or only coping options available to the RA patient who has yet to learn the benefits of other forms of coping such as those taught in recent studies of coping skill training (O'Leary et al, 1988; Parker et al, 1988b; Bradley et al, 1987). Coping with RA shall therefore be conceptualized as involving the patient's use of beliefs, practices and resources to manage chronic threats of varying intensity to the patient's quality of life.

Background to RA Coping Research

Research into the coping responses of RA patients has largely been developed from the general literature on coping with stress. In this literature a number of theoretical models of human coping behaviour have been developed (e.g., Abramson, Seligman & Teasdale, 1978; Bandura, 1977, 1982; Billings & Moos, 1981; Kobasa, 1979; Lazarus & Folkman,1984; Pearlin & Schooler, 1978). Taxonomies of coping styles and behaviours (e.g., Brickman, Rabinowitz, Karuza, Coates, Cohn & Kidder, 1982; Carver & Scheier, 1989; Fernandez, 1986) have followed. Demographic factors such as education and economic status (Pearlin & Schooler, 1978), age (Blanchard-Fields & Irion, 1988; Folkman, Lazarus, Pimley & Novacek, 1987), and sex differences (Holohan & Moos, 1985; Folkman & Lazarus, 1980) have been factors identied as influences on coping. The nature of the stressor also influences the forms of coping used (Depue & Monroe, 1986; Felton & Revenson, 1984; Suls & Fletcher, 1985). While there is no single preferred method of coping in general or specific circumstances (Litt 1988), generalizations regarding the efficacy of certain coping practices, beliefs and resources have been reported for general and specific populations (e.g., Pearlin & Schooler, 1978; Stein et al, 1988b; Turner, Clancy & Vitaliano, 1987. Finally, it has been demonstrated that individuals can acquire coping resources and learn specific coping beliefs and practices - apparently benefitting from their use (e.g., Alberti & Emmons,1972; O'Leary et al,1988; Turk, Meichenbaum & Genest, 1983). Coping with stressors of any kind is clearly a complicated, modifiable process involving many factors.

Coping with Chronic Illness

Research into coping with chronic illnesses such as RA has barely begun to offer insights about a form of chronically uncertain stress which should be seen as posing challenges beyond those involved with one's "normal" exposure to stress. Despite the major advances of medicine during this century, chronic illness remains a behavioural problem for which each affected person bears considerable responsibility (Burish & Bradley, 1983). Coping with chronic disorders is clearly a different, more complex, stressor than those most frequently studied in stress research; it affects the individual differently and calls for different coping responses (Depue & Monroe,1986). Ultimately, for most chronic illnesses such as RA, patients are called upon to develop lifestyles where their illness ceases to be the dominant element in their lives - or at least minimally disruptive (Shontz, 1982).

Fortunately, it appears that there are patient responses to illness which, when present, make this challenge less insurmountable. However, efforts to identify these responses have been largely based on theoretical models and constructs of coping used in general stress research. These models and constructs were recently critiqued with the authors concluding that, "Coping is not out of the woods yet." (Tunks & Bellissimo, 1988, p.174).

Comprehensive generalizations regarding the most efficacious forms of coping that chronically ill patients could make to exercise "participatory control"

(Reid, 1984) may help in optimizing the outcomes of the health care specialist-patient treatment relationship.

While coping models, taxonomies and psychoeducational interventions have been applied to the study of coping with chronic illness (e.g., Felton & Revenson, 1984; Pilowsky, 1987; Tan, 1982), these approaches to coping research typically focus on a narrow range of the stressful experiences of being chronically ill, and on a narrow range of coping beliefs, practices, and resources that may be mobilized to "cope". The literature on "illness behaviour" (e.g., Bradley & Burish, 1983; Mechanic, 1985; Moos & Schaefer, 1984) provides a more comprehensive perspective on the coping challenges faced by a chronically ill person. A recent review of coping studies in health-care settings challenged researchers to take this view when studying coping with chronic illness,

> "the data obtained in most coping research with chronic disease patients has been of limited theoretical and practical value because chronic diseases are treated as unitary stressors rather than as complex situations subsuming multiple substressors, each with its own coping demands." (Auerbach, 1989, p. 389)

The Challenge of Coping with RA

The present study assumes that RA patients must cope with "internal" stressors such as threats to physical comfort and functional ability, while mustering responses to manage "external" stressors such as: dealing with health care environments and special treatment procedures; developing and maintaining adequate relationships with health care staff; preserving a reasonable emotional balance; preserving a satisfactory self-image and sense of competence and mastery; sustaining relationships with friends and family;

preparing for an uncertain future (Moos & Schaefer, 1984). Coping with a chronic illness such as RA is a complex and continuously changing process requiring modifications of coping responses to manage different illness symptoms and the illness-influenced interpersonal relationships in the patient's life.

Clearly, not all responses made to the symptoms of chronic illness are efficacious (Regan et al, 1988). Different symptoms and circumstances call for different responses. For example, from a longitudinal study of the coping responses of RA patients, Gibofsky and his colleagues (Gibofsky, Revenson & Schiaffino, 1988) concluded that different coping responses were effective in coping with pain than were effective in coping with functional disability. Other research has suggested that a complicating factor in this already stressful process is that, "individuals attempt to regulate their responses to chronic diseases appropriate only for more acute illnesses." (Burish & Bradley, 1983, p. 5). This finding has been corroborated in research on the mechanisms of chronic pain (Fordyce, 1986; Philips, 1987; Wall, 1984).

As is often the case in chronic pain problems, difficulties in coping with chronic illness may be related to an excessive stability of perceptual and behavioural organization (Chapman, 1986). Patients could habitually use inappropriate coping responses given the nature of their symptoms. The chronic and variable symptoms of RA, in combination with the illness tasks listed above pose complex and exhausting demands on the individual with RA.

To bring some clarity and parsimony to the study of coping with RA, a body of literature which has evolved in fragmentary fashion from diverse theories and constructs, this author has chosen to classify and examine coping according to three dimensions: coping beliefs, coping practices, and perceived coping resources. The review of coping models and constructs which follows has been organized to reflect these three dimensions of coping. In making this decision, it is realized that coping has been classified in ways which could be viewed to some degree as co-dependent. It should be borne in mind that coping has been defined here as any response taken to manage the symptoms of RA, regardless of that response's efficacy. All beliefs, practices and resources used by RA patients to promote a satisfactory quality of life are therefore viewed as forms of coping.

Coping Beliefs

Coping beliefs, a product of cognitive processes, will be conceptualized here as generalizations about an individual's capacities to cope with apparently familiar stressors. Rokeach (1968) has suggested that, "beliefs are inferences made by an observer about underlying states of expectancy" (p.7). Mounting evidence suggests that patients will seek causal inferences, regarding illness, especially when they have been unsuccessful in managing the course of the illness (Affleck, Pfeiffer, Tennen & Fifield, 1987). These attributions, or beliefs, have been associated with health outcomes, emotional well-being and coping practices in patients with serious illness (Affleck et al, 1987; Stein,Wallston, Nicassio & Castner, 1988b) and in persons following certain life events (Goodhart, 1985). As Rotter (1966) has shown, expectancies or beliefs influence an individual's choice of behaviours. In the case of RA, it is assumed in the present study that patients base their coping responses on the beliefs they have regarding their symptoms and coping capacities.

An overview of research and theory regarding the role of beliefs in coping with chronic illness, particularly as it relates to "illness behaviour" (Mechanic, 1985), shall be undertaken in the following section. This will be followed by a selective review of the theoretical models of coping of Lazarus-Folkman (1984), Bandura (1977, 1982, 1986) and Seligman (Abramson, Seligman & Teasdale, 1978; Seligman, 1980). Empirical tests of these models shall also be discussed as they relate to research on coping with RA and other chronic illnesses.

Coping Beliefs and Illness Behaviour

Coping beliefs, or "illness representations" (Nerenz & Leventhal, 1983), are both prescriptive and evaluative in that they provide a rationale for the selection and deployment of coping responses deemed appropriate for counteracting a perceived stressor, and the means for assessing the effectiveness of those responses. Leventhal (1987) suggested that such representations, or beliefs, include at least four type of attributes: "1) a possible cause; 2) an identity (label and symptoms); 3) a set of possible consequences (physical, social, economic, etc.); and 4) time-lines (speculations as to the duration of the illness, time of onset, and duration of its consequences, etc.)" (p.232). These beliefs are also potentially self-fulfilling, or tautological, in that they also set the criteria for evaluating the success of the coping efforts (Leventhal, 1987). For example, a belief that one is faced with an illness or stressor expected to be unmanageable will likely result in the selection and use of coping efforts that will confirm the perceived expectation.

As an example of the importance of beliefs in illness behaviour with RA, one only has to look at the research on patient noncompliance with prescribed medications and exercise. When this problem has been examined more closely, it is apparent that patients judge the appropriateness of complying with their treatments using past experience and personal predicitions of the regimen's therapeutic efficacy (Beck, Parker, Frank, Geden, Kay, Gamache, Shivvers, Smith & Anderson, 1988). Lorish et al (Lorish, Richards & Brown, 1989) examined the self-reported intentional and unintentional reasons why RA patients did not comply with their prescribed treatments. Unintentional reasons included changes in activity routines, running out of medication, feeling well and forgetting; but intentional reasons included beliefs of undesirable side-effects, expense, choice not to use medication because they felt better. Beliefs regarding the regimen's efficacy based on judgments from the suggestions of other people under treatment for arthritis are also a factor in noncompliance (Arluke, 1980). Other factors hypothesized to influence treatment noncompliance include: general health motivation; evaluation of practitioner and medication care; the quality of the health-care provider-patient relationship; perceived susceptibility to recurrence of the illness; structure of medication regimen; cues to action and cues reinforcing the threat of the illness; belief in one's personal self-efficacy in carrying out the health recommendation (Meichenbaum & Turk, 1987, p.53). Patient beliefs in the efficacy of their treatment seem important to this primary coping activity and likely influence the practice of other personal coping practices as well.

Coping beliefs are subjectively based on perceptual processes which are prone, positively or negatively, to errors such as distortion and overgeneralization (Pennebaker, 1982). An illustration of this has been shown by Smith and his colleagues (Smith, Peck, Milano & Ward, 1988) who demonstrated that cognitive errors are used by depressed RA patients in negatively appraising their functional ability. This research is supported by findings in similar studies of chronic pain patients (Keefe & Gil, 1986; Lefebvre, 1981; Smith, Follick, Ahern & Adams, 1986).

Other research underscores the importance that forms of belief can play in RA patients' coping efforts. Zautra et al, (1989) recently identified associations between RA patients' appraisals of personal coping efficacy with life-stress events and alterations in immune system functioning. Flor and Turk (1988) identified a strong correlation between negative self-statements, a manifestation of patients' beliefs, and self-reported pain and disability in RA patients. Pow (1987) concluded that the negative cognitive style of certain RA patients towards RA had developed as a result of the illness because such negative thinking was not evident toward other aspects of the patients' lives. From a random telephone survey of the general population, Price et al (Price, Hillman, Toral & Newell, 1983) concluded that the public's perceptions regarding arthritis were largely ill-informed and mistaken. Should such perceptions or beliefs be used as the basis for coping efforts, it should follow that these efforts would be inefficacious. Nerenz & Leventhal (1983), when reviewing the importance of beliefs or other forms of cognition in illness experience, tentatively concluded, "Perhaps the central issue in chronic illness is how representation of the illness is related to the underlying self-system." (p.27)

The Lazarus - Folkman Coping Model

Central to the coping model of Lazarus and Folkman (1984) is the role played by representations or beliefs regarding the stressors to be managed. Their model hypothesizes that coping is a dynamic interactional process between: a) an individual's appraisals of internal and/or external demands, b) appraisals of the individual's coping resources and coping options for responding to these demands, c) behaviours used to manage these demands, and d) further appraisals regarding the success of these coping behaviours. The internal demands to be managed, according to this coping model, are troubling emotions.

In this model two levels of appraisal are involved in coping: primary appraisals where individuals attempt to answer the question "What do I have at stake in this encounter?"; and secondary appraisals where the concern is "What can I do?" (Folkman & Lazarus, 1988). The critical role of appraisals to the coping process was recently highlighted,

> "Stressful circumstances do not take their toll from a passive individual...but from an individual who is imbuing stressful circumstances with personal meaning and struggling to master and control these circumstances." (Holroyd & Lazarus, 1982, p.22)

The variability in people's coping responses is attributable, to a large degree, to their subjective appraisals/ beliefs of 1) what is at stake in specific stressful encounters and 2) what they appraise as their options for coping in those encounters (Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1986).

Empirical tests of the Lazarus-Folkman model with chronically ill people support the theoretical contention that appraisals play an important role in the selection of coping practices. Using a measure developed from the Lazarus-Folkman coping model, adapted for chronic illness populations, Felton & Revenson (1984) found that the choice of information-seeking versus wish-fulfilling fantasy coping strategies was related to primary appraisals of the controllabilty of the illness symptoms. In another study of appraisals of ability, Affleck and his colleagues (Affleck, Tennen, Pfeiffer & Fifield, 1987b) concluded that beliefs in personal control over daily RA symptoms were associated with less mood disturbance in patients with relatively active symptoms. However, when appraisals of personal control over the course of RA were studied, greater mood disturbance and poorer psychological adjustment was found in patients with relatively severe disease. Overall, research based on operationalizations of the

Lazarus-Folkman model suggests that primary appraisals guide the selection of coping practices in chronic pain and RA patients.

Bandura's Self-Efficacy Model

In Albert Bandura's (1977,1982,1986) model of human behaviour, cognitive processes, and resulting beliefs, are assigned the primary role in the acquisition and retention of coping behaviour. Behaviour change and maintenance, according to his model, are a function of 1) expectations about the outcomes that will result from one's engaging in a behaviour; and 2) expectations about one's ability to engage in or execute the behaviour (Strecher, McEvoy-DeVellis, Becker & Rosenstock, 1986). Thus, it is the beliefs in behavioral outcomes and expectancies that one can perform the behaviours necessary to achieve those outcomes that are central to all behaviours. Once the individual comes to believe in the efficacy of personal skills capable of meeting the exigencies of the challenge, a sense of predictability or control has developed that is stress reducing (Bandura, 1982). The acquisition and maintenance of these coping behaviours, the standards used to evaluate their deployment, the incentives used to mobilize their use, and the ongoing evaluation of coping challenges are guided by the individual's self-referential thinking or beliefs. Critical to Bandura's theory is the role of self-efficacy beliefs in guiding and evaluating behaviour, or self-functioning.

Bandura defined self-efficacy as,

> "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. Self-efficacy is not concerned with the skills that one has, but with judgments of what one can do with whatever skills one possesses."(Bandura, 1986, p.391).

The selection of circumstances in which coping tasks are called for, the amount of effort expended on a task, persistence at that task, and consequent evaluations of the success of that task are all influenced by self-efficacy beliefs. These beliefs are situation-specific and function as expectations in those specific situations. People will execute tasks which fall within their range of perceived self-efficacy, but will shun or fail at those which exceed their perceived coping capacities (Bandura, 1982). However, people with confidence in their coping behaviours, or perceived self-efficacy, will more likely mobilize efforts to succeed in high risk situations and, as they do, further strengthen their perceived self-efficacy. Successful coping, according to Bandura, is based on beliefs of self-efficacy in deploying coping skills effectively..

Important to Bandura's theory is the difference between self-efficacy expectancies and outcome expectancies. He wrote that,

> "Efficacy and outcome judgments are differentiated because individuals can believe that a particular course of action will produce certain outcomes, but they do not act on that outcome belief because they question whether they can actually execute the necessary activities." (Bandura, 1986, p. 392).

People may thus choose not to cope either because they believe they cannot do what is required or give up, still assured of their capabilities, because they expect no results from their efforts due to the unresponsiveness, negative bias, or punitiveness of the environment (Bandura, 1982). In RA, this choice of temporarily not practicing certain coping skills at times of unusually severe pain or disability may be important because of the implicit belief that one could return to normal coping practices successfully after the symptom flare-up has abated. Of the two types of expectations, Bandura assigns a more critical role to the efficacy expectations, "the types of outcomes people anticipate depend largely on their judgments of how they will be able to perform in given situations." (1986, p.392) Bandura's model is primarily based on the role that efficacy expectations - inferred from interactions between skills, environmental demands, and evaluations of the use of those skills - play in the selection, mobilization, persistence, and evaluation of coping behaviours across different situations.

Empirical studies using the self-efficacy construct have been supportive of Bandura's theory. O'Leary (1985), in her review of literature on the self-efficacy construct and its relationship to health, concluded that patient beliefs regarding their coping efforts and the benefits of the treatment regimen predicted persistence in these coping efforts. Measures of self-efficacy have been correlated with the ability to tolerate experimental pain (Bandura, O'Leary, Taylor, Gauthier & Gossard, 1987; Dolce, Doleys, Raczynski, Lossie, Poole & Smith, 1986) and have predicted gains in the ability to tolerate experimental pain (Vallis & Bucher, 1986).

In studies of RA patients, one research team (Blalock, McEvoy-DeVellis, DeVellis & Sauter, 1988) concluded that decreased well-being appeared to result only with dissatisfaction in one's physical abilities, a finding supportive of Bandura's (1986) construct of self-efficacy expectations. In an earlier elaboration of this study Blalock, (1987) reported that self-efficacy beliefs (i.e., satisfaction with one's capabilities) were modestly related to measures of physical activity, mobilitity,household activity, and psychological adjustment. Shoor and Holman (1984), in an initial operationalization of Bandura's self-efficacy construct for arthritis patients, interpreted the results using their measure as suggesting that self-efficacy beliefs predicted future pain and disability. More recently, Lorig and her colleagues (Lorig et al, 1989) have shown that increases between pre and post-test scores on a new scale measuring self-efficacy beliefs, following psychological treatment, predicted increases in physical comfort and functional ability.

Self-efficacy beliefs, in this model, are the most important factor in the practice of coping behaviour. To paraphrase Bandura, (coping) behaviour is predicated on the belief that one can successfully perform the behaviour.

Seligman's Learned Helplessness Theory

Coping beliefs, can also be seen as evidence of psychopatholgy. The "learned helplessness" theory developed by Seligman and his colleagues (Abramson, Seligman & Teasdale, 1978; Seligman, 1980) originally was proposed to account for depression. At the core of "learned helplessness" is the consistent belief that desired behavioural outcomes are unattainable or beyond an individual's control. Seligman (1980) suggested that

> "helplessness", or the expectation that an outcome is independent of responding, 1) reduces the motivation to control the outcome; interferes with learning responding controls the outcome; and if the outcome is traumatic, 3) produces fear for as long as the subject is uncertain of the uncontrollability of the outcome, and then produces depression." (Seligman, 1980, p.56).

This view has been borrowed from Rotter's (1966) social learning theory of generalized expectancies, a theory to account for individuals' consistent beliefs that certain behavioural outcomes are contingent on behaviours within their personal (or internal) control or are contingent on factors external to their personal control. According to Seligman and his colleagues, successful coping follows from beliefs in the ability to control aversive outcomes.

> "Learned helplessness", on the other hand, results from the following sequence of events: *Objective noncontingency between acts and outcomes --> perceptions of past and present noncontingency --> expectations of future noncontingency --> symptoms of helplessness* (authors' italics - Abramson et al, 1978, p.52).

Helplessness arises from motivational and cognitive deficits as a consequence of an expectation of uncontrollability. These controllability expectations can be internalized or externalized across stable or unstable situations which are either specific or global in nature (Abramson et al, 1978, p.58). Coping success, as implied in the Seligman model, is therefore dependent on internal attributions of control by the individual over specific or global desired outcomes such as control of pain.

Measures of "learned helplessness" beliefs have been shown to relate to indices of illness activity, quality of life outcomes and psychological adjustment in RA patients (Callahan et al, 1988; Crisson & Keefe, 1988; Stein et al, 1988). Crisson & Keefe (1988) concluded that RA patients who viewed pain as being beyond their behavioural control used coping strategies which were not effective in controlling their pain and, correspondingly, reported higher levels of pain. Stein et al (1988b), in a two year longitudinal study, using a measure of "learned helplessness" designed specifically for arthritis patients, were able to identify distinct clinical courses for patients described as low "helplessness", high "helplessness" and "normal". They further suggested that a classification of high "helplessness" be used to "red flag" patients expected to have difficulty with arthritis. Affleck et al (1987a) identified an association between patients' beliefs in medication change as the most significant perceived cause of disease remission, a finding they associated with scores on the Arthritis Helplessness Index. Callahan and his colleagues (1988) identified a weak correlation between their measure of helplessness and four disease activity measures (joint count, morning stiffness, duration of disease, and Westergren erythrocyte sedimentation rate). It would appear, then, that helplessness beliefs are related to both clinical and secondary features of RA. Helplessness beliefs are, however, a negative way of conceptualizing the role that beliefs play in coping with RA.

Beliefs and Coping with RA: A Critical Summary

Research into the importance of beliefs in coping suggests that behaviours and/or illness symptoms believed to be under the control of the individual are related to favourable outcomes in terms of quality of life. Seen alternatively, beliefs in the futility of controlling symptoms, or the behaviours used to manage them, have been related to poorer quality of life outcomes. As is often the case in problems of chronic pain, difficulties in coping with chronic illness may be related to an excessive stability of perceptual and, correspondingly, behavioural organization (Chapman, 1986). Coping beliefs in the chronically ill, such as RA patients, may thus function in a static manner despite the ongoing fluctuations in the symptoms of the illness. This would mean that the deployment and evaluation of illness-specific coping practices could be based on inaccurate appraisals of both symptom severity and the efficacy of coping practices used to manage those symptoms. Control beliefs appear to influence the clinical features of RA (Callahan et al, 1988) and those aspects of RA referred to here as quality of life (Lorig et al, 1988; Regan et al, 1988; Stein et al, 1988b).

While the beliefs hypothesized in the models of Lazarus-Folkman, Bandura, and Seligman have apparent similarities, there are theoretical differences in how these beliefs are seen to alleviate stress. Lazarus and

Folkman (1984) postulate that there is an interactive process between beliefs and practices used to manage both environmental threats and the threats created by emotional upset created in the stressful encounter. A potential flaw in this view is that they view the cognitive and behavioral efforts of individuals as constantly changing (Lazarus & Folkman, 1984) in the stressful encounter when, in the case of chronic stressors such as the symptoms of a chronic illness such as RA, established patterns of coping appear to develop (e.g., Flor & Turk, 1988; Revenson & Felton, 1989). Bandura (1986) and Seligman (1980) hold that beliefs are most central to coping in that they determine coping practices without viewing the stress management task in the dualistic fashion (i.e., environmental and emotional) proposed by Lazarus and Folkman. A theoretical weakness in the Seligman model is that it views belief in the controllability of outcomes as being derived from an **objective** assessment of those outcomes (Peterson, 1982), a fundamental error if one believes that subjective factors are involved in the appraisal of physical symptoms (Pennebaker, 1982). In a recent comparative study of the beliefs of these three models (Schiaffino, Blum, Revenson & Gibofsky, 1987), the researchers concluded that self-efficacy beliefs (Bandura, 1982) were most highly correlated with functional status and mental health status. However, at that time, the researchers used, as their measure of "helplessness", the Arthritis Helplessness Index which has since been found to consist of two somewhat contradictory factors (Stein et al, 1988a). The extent to which the beliefs of these models are discrete or redundant measures is still uncertain though it appears each has the capacity to predict quality of life outcomes in RA patients.

An unfortunate byproduct of seeking medical care for chronic illness can occur when patients adopt a maladaptive set of beliefs regarding their personal capacities to influence the symptoms of their illness. The patient's personal care is often "totally" delegated to medical practitioners while the patient may practice behaviours, consistent with their coping beliefs, which undermine treatments received from those practitioners. Reid (1984) concluded, from his review of studies of relationships between locus of control and illness adjustment, that a patient, while externalizing some belief in his or her control over symptoms, still requires some "participatory control" over these symptoms. This "participatory control", he hypothesized, is inevitably exercised in varying degrees in the treatment relationship. In the present study, this participatory control is seen to be at the heart of the beliefs utilized for self-care. Whether these beliefs most accurately reflect the constructs of personal helplessness, self-efficacy or primary and secondary appraisals is still uncertain. For the purposes of this study, two forms of coping belief will be assessed, "arthritis self-efficacy" and "arthritis helplessness".

Coping Practices

While beliefs are considered in the present study to be central to an RA patient's coping responses, so are the behaviours or coping practices used by that patient. The present study assumes that individuals respond to the stress of RA using practices which correspond with their coping beliefs and coping resources.

Typically, coping is viewed as a process involving behavioral practices to manage internal and external demands on the individual. Coping practices are viewed here as habitual behavioural responses people make to manage stressful demands such as those posed by RA. Researchers have made a number of attempts to identify and classify these practices generally, (e.g., Billings & Moos, 1981; Lazarus & Folkman, 1980; Pearlin & Schooler, 1978) and with specific populations (e.g., Fernandez, 1986; Moos & Schaefer, 1984). As yet, no taxonomy of coping practices has been developed for RA patients. Models used in RA coping research have usually been borrowed from other areas of coping research with the possibility that practices unique to coping with RA have been overlooked.

Coping practices, in the case of chronic illness, could also include prescribed or sanctioned health behaviours such as following treatment regimens and maintaining daily routines of health-promoting activity. Bearing in mind that the individual with RA faces demands posed by internal, treatment regimen and interpersonal facets of the illness experience - along with normal or other personally-specific psychosocial stressors - that individual is called upon to manage many stressors simultaneously. This review shall examine specific and general health behaviours as well as theoretical classification systems of coping practices which have been applied to the study of coping in RA patients. Also, the psychodynamic construct, "alexithymia" shall be discussed since it has been linked to the presence of "psychosomatic illnesses", of which RA is considered to be an example. First, however, attention shall be turned to those practices most commonly recognized as health-promoting.

Long and Short-Term Health Behaviours

Coping, from a medical standpoint, is largely based, in the short term, on compliance with prescribed treatment regimens, yet estimates of treatment noncompliance are high (Belcon et al,1984). Problems in adherence to treatment regimens compromise the health-restoring or health-maintaining potential of medical treatment while adherence can be viewed as part of the patient's way of optimizing the treatment relationship. Questions will be asked of RA patients participating in the present study regarding their adherence with prescribed medication and exercise regimens, permitting an evaluation of how these self-reports relate to the quality of life measures. From these questions, it will be possible to identify relationships between treatment compliance self-reports with coping and quality of life variables.

Longer term coping involves the practice of general health behaviours advocated by prevention-oriented health care specialists (Pomerleau & Rodin, 1986; Strecher et al, 1986). However, the practice of these behaviours, such as proper diet and exercise, is often curtailed or reduced during illness. Fordyce (1976, 1986) has suggested that declines in activity levels have effects on patients' physical and emotional health. Bortz (1984) referred the results of these declines in activity the "disuse syndrome".

Associated with the disuse syndrome is muscular wasting and stiffening, a breakdown in the body's feedback-integrating mechanisms, decreased catecholamine secretion, obesity, cardiovascular vulnerability, musculoskeletal fragility, premature aging, and depression (Bortz, 1984). The results of disuse can also create further secondary problems like painful muscular spasms which are activated in response to perceived stress (Flor, Turk & Birbaumer, 1985). The sad irony is that RA patients identify resting and activity pacing as more effective ways to gain control over their daily symptoms than efforts to mitigate or cope with stress (Affleck et al, 1987). The "rationale" for this type of coping practice is borne out by research which suggests that there are distinguishable differences in pain self-reports at rest and for different types of activity (Badley & Papageorgiou, 1989). Should passivity be the course taken by a patient with a chronic illness, it is likely that a steadily shrinking world of health and experience, accompanied by diminished enthusiasm and commitment to life, will ensue.

General health behaviours can be maintained despite illness-related beliefs that make their practice seem impossible. For example, Linton (1985) found that chronic back pain patients' assumptions regarding the pain that would occur with specific forms of activity was not supported by their self-reports of pain while engaged in those activities. Still, research has indicated that patients can diminish dysfunctional pain behaviours (albeit with no significant differences in self-reported pain) and achieve more functional styles of living (Bradley et al, 1987; Fordyce, 1976). The practice of general health behaviours and maintenance of illness-appropriate activities are therefore crucial coping practices for RA and other chronic illness patients. In the present study, a number of questions will be asked of participants regarding their practice of certain general health behaviours. More specific coping behaviours which are not so commonly known have been identified by Lazarus and Folkman.

Lazarus-Folkman Model

Lazarus and Folkman (1988) suggested that there are three basic strategies of coping:

> " 1) cognitive activity that influences the deployment of attention, 2) cognitive activity that alters the subjective meaning or significance of the encounter for well-being, and 3) actions that alter the actual terms of the person-environment relationship" (p. 311).

The two primary functions of coping, according to the Lazarus-Folkman model, are problem-focused coping and emotion-focused coping (Folkman et al, 1986a). It is the dynamic nature of their model, depicted as managing both environmental and emotional demands, that makes it the most widely accepted of the coping models.

The Ways of Coping Checklist (Folkman & Lazarus,1980) has been used to operationalize this model in the measurement of coping responses used in a specific stressful encounter. In a study using the revised Ways of Coping Checklist, Turner and her colleagues (Turner et al, 1987) concluded, as support for the Lazarus-Folkman model, that chronic pain patients' initial appraisals of their pain influenced the choice of coping strategies. The emotion-focused strategies were related to higher degrees of pain.

Felton and Revenson (Felton & Revenson, 1984; Felton, Revenson & Hinrichsen, 1984; Revenson & Felton, 1989) have used a version of the Ways of Coping Checklist adapted for chronic illness populations to study the responses of patients in four illness groups: cancer, rheumatoid arthritis, diabetes and hypertension. In the two 1984 studies (Felton & Revenson, 1984; Felton et al, 1984) reported that patients used active forms of coping such as information seeking when coping with an illness that seemed more controllable and emotion-focused coping such as wish-fulfilling fantasy when the stressor seemed outside of patients' control. In a recent study which specifically examined the relationships between RA patients' coping strategies and appraisals, levels of functional ability, and psychological adjustment, Revenson & Felton (1989) again concluded that the primary use of emotion-focused coping led to poorer psychological adjustment. Patients using more active forms of coping such as information-seeking showed better adjustment though correlations were not strong in magnitude. In summing up their years of research in this field, they commented,

> "Results from our broader program of research on coping with chronic illness suggest that while there are reciprocal influences between coping and well-being, the effect of coping on well-being are somewhat stronger than the effects of well-being on subsequent coping, but causal direction cannot be conclusively

established with the data presented here" (Revenson & Felton, 1989, p.16).

The research team headed by Parker (Parker, McRae, Smarr, Beck, Frank, Anderson & Walker, 1988) used the Felton-Revenson revision of the Ways of Coping checklist along with disease activity measures, pain measures and other psychological measures with 84 RA patients. They found that the practices of wish-fulfilling fantasy and self-blame were associated with greater distress and disability while the use of cognitive restructuring, or viewing the illness and its concomitants in a more favourable way, was associated with more favourable psychological and functional abilty outcomes.

Other measures have been used to operationalize the Lazarus - Folkman model in coping research with RA patients. Cohen and her colleagues (Cohen et al, 1985) examined five modes of coping and found that, in coping with pain and threats to self-esteem, RA patients' primary choice was cognitive methods such as reappraisal or attention focus. Regan, Lorig and Thoresen (1988) have developed a specific modification of the Ways of Coping Checklist for arthritis patients. From studying the responses of osteoarthritis patients on this measure, and measures of health pain, arthritis self-efficacy (Regan et al, 1988), depression and activity, a number of findings were reported. Less active coping styles, referred to by Regan as "dependency coping" (Regan, personal communication September, 1989), were related to greater pain and depression. These coping styles were also strongly related to primary appraisals of threat and negative self-efficacy beliefs. Strongly negative relationships between the measures of primary appraisals and self-efficacy were indicated.

It would appear then that, according to the Lazarus-Folkman model, a vicious circle can exist: inefficacious coping practices are selected on the bases of primary appraisals that more efficacious coping practices would be unsuccessful. Efforts are then turned toward managing the emotional demands raised by the secondary appraisal that one cannot cope with the stressful demands, leaving the original stressor to perpetuate or exacerbate the cycle. The irony in the research using operationalizations of the dynamic coping model of Lazarus and Folkman is that static retrospective measures have been used to make generalizations regarding coping practices which are purportedly constantly changing. The present study assumes that, in response to the chronic stress of RA symptoms, habitual practices are used by patients, another factor inadequately addressed in the Lazarus-Folkman model. These habitual practices have been further classified in to coping styles.

Coping Styles

A coping style approach to studying coping responses gives up specificity in identifying coping practices for a few generalizations about the nature of one's coping. For example, Brown, Nicassio and their colleagues (Brown & Nicassio, 1987; Brown, Nicassio, Wallston & Stein,1988) have dichotomized coping behaviour into "active" or "passive" coping practices. Preliminary results using their measure of active and passive coping, the Vanderbilt Pain Management Inventory, have indicated that the use of active coping strategies is associated with less pain, less depression, less functional impairment, and higher general self-efficacy with an opposite pattern of relationships found in patients using predominantly passive coping strategies (Brown & Nicassio, 1987). A longitudinal study of RA patients using this measure (Brown et al, 1988), found that the use of passive coping efforts led to increased depression, greater pain, more days of inactivity, more doctor visits, and less life satisfaction. In contrast to the earlier study, opposite relationships were not found in this case, with the exception of a weak correlation between active coping and functional ability. A recent study (Manne & Zautra, 1989) factor analyzed the Felton & Revenson revision of the Ways of Coping into two factors that resemble the scales described above. The results of correlation analyses using these factors with measures of patients' quality of life produced findings similar to those of Brown et al. In the present study, the scale developed by Brown and Nicassio will be used as a measure of coping practices and, more specifically, coping styles. A more specific form of coping practice common to most people coping with a chronic illness has been referred to as cognitive coping.

Since important differences related to an individuals' quality of life have been found according to coping style choice, the present study will evaluate the relationship of coping styles to other coping and quality of life variables. It will be possible to identify from these variables, factors which predispose individuals to certain styles of coping.

Cognitive Coping Practices

It would appear that cognitive coping practices are the most prominent form of coping practices for arthritis patients, perhaps because pain and disability seem like stressors for which no behavioural coping strategies are believed to be effective. Given the importance placed on beliefs in coping with RA, it would appear important to differentiate between coping beliefs and cognitive coping practices before proceeding with this discussion. Coping beliefs refer to representations or attributions regarding symptoms and the practices and resources which can be used to cope with those symptoms. Cognitive coping involves the use of specific practices to manage stressful demands such as RA symptoms.

Attempts have been made to classify cognitive coping responses (Fernandez, 1986) and examples of these practices are included in most measures of coping. Other examples of these practices have been evaluated in recent research. In studying the pain coping strategies of osteoarthritis patients, Keefe and his colleagues (Keefe, Caldwell, Queen, Gil, Martinez, Crisson, Ogden, Nunley, 1987) concluded that the Pain Control and Rational Thinking Factor of the Coping Strategies Questionnaire (Rosenstiel & Keefe, 1983) was an important predictor of pain, health status, and psychological distress. Individuals scoring high on this factor had less severe pain, better health status, and lower levels of psychological distress than those scoring low on this factor. From a recent longitudinal analysis using one subscale of the Coping Strategies Questionnaire, Keefe et al (Keefe, Brown, Wallston & Caldwell, 1989) concluded that RA patients who scored high on the measure of "catastrophizing" as a coping practice demonstrated poorer outcomes on self-reports of pain, physical ability and depression than did patients who scored low on this measure. A similar study of RA patients' self-statements (Flor & Turk, 1988) reported that significant differences in pain and physical ability were attributable to patients' use of coping or catastrophizing self-statements. Other, more adaptive cognitive pain-coping practices have been identified: sensation-acknowledgement (Wack & Turk, 1984; Phillips, 1988), prayer (Rosenstiel & Keefe, 1983) transformative imagery, coping self-statements, reinterpretative self-statements (Fernandez, 1986); use of hypnotic phenomena such as age progression or regression, mystical states, time distortion, analgesia, dissocation, anaesthesia, sensation substitution and displacement (Erickson, 1966; Hilgard & Hilgard, 1983;

Sacerdote, 1981), focus on physical characteristics of the environment and transformation of context (Tan, 1982), distraction (Lazarus & Folkman, 1988; McCaul & Malott, 1984) and use of pleasant imagery (Chaves & Barber, 1974). It should be noted that these strategies are selectively appropriate given the intensity and chronicity of the pain, and those strategies which focus on distraction are capable of providing only short term relief with moderately severe pain sensations (McCaul & Malott, 1984). This conclusion was supported by the results of a meta-analysis which compared avoidant versus nonavoidant coping strategies indicating that avoidant strategies are effective for short-term stressful encounters while nonavoidant strategies are more effective for longer term encounters (Suls & Fletcher, 1985). Both avoidant and nonavoidant strategies have been successfully learned by chronic pain patients to manage episodes of acute and chronic pain (Phillips, 1988; Turk et al, 1983). The acute and chronic nature of RA symptoms suggests that a variety of cognitive coping practices may be appropriate for the fluctuations in symptom intensity. One further form of cognitive coping practice has been recently developed by psychodynamic researchers.

Alexithymia and the Somatization Hypothesis

Psychoanalysts have long suggested that the ability to symbolize, or assign meaning, to emotional experience is a key to the psychological health of the individual. An inability to express troubling emotions has been theoretically linked to a host of neurotic and psychosomatic symptoms and has been regarded as key to the process of "somatization" (Lipowski, 1987). Somatization refers to the tendency to experience or express psychological states as somatic symptoms or involves the use of somatic symptoms for psychological purposes (Kirmayer, 1985). The ability to regulate emotional experience by means of symbolic and verbal expression is a practice which may affect a RA patient's quality of life. Lack of this ability has been referred to as "alexithymia".

"Alexithymia", a term developed from the clinical observations of psychodynamic therapists, refers to the inability to differentiate and describe feelings. Descriptive facets of "alexithymia" include an absence of affect and fantasy, a tendency toward preoccupation with trivial detail, complaints of physical symptoms not necessarily related to underlying illness, an impaired capacity for empathy, a lack of psychological mindedness, a boring interpersonal presence, an inability to provide self-care, and resistance to insight-oriented therapy (Bagby et al, 1986; Krystal, 1981; Shipko, 1982; Taylor, 1984; von Rad, 1984). Two forms of alexithymia have been hypothesized; "primary alexithymia" which is a lifelong dispositional factor promoting somatic illness and "secondary alexithymia" which results from a specific illness or stressor (Greenberg & Dattore, 1983, Shipko, Alvarez & Noviello, 1983).

Alexithymia has been estimated to affect a small minority of the population, with males having far greater proportional representation than females (8.2% to 1.1%, Bagby et al, 1988a), but could be regarded as a range concept present in individuals to varying degrees (Swiller, 1988). Seen this way, it could be seen as an abilty to psychodynamically regulate or cope with emotion. Taylor (1987) has suggested that the essential problem for alexithymic individuals is, "not the failure to "discharge" emotions, but rather an inability to tolerate affects and derive information from them." (p.89).

Different explanations for alexithymia have included resistance to role-expected behaviour in psychodynamic psychotherapy and cultural biases in affective expression (Kirmayer, 1987a), retarded cognitive-emotional development (Lane & Schwartz, 1986), a disconnection between the cerebral hemispheres (Miller, 1986; Tenhouten, Hoppe, Bogen & Walter, 1985), an adaptive blunting of emotional experience resulting from post-traumatic stress disorder (Shipko, Alvarez & Noviello, 1983), and disturbances in mother-child relationships (Swiller, 1988).

Support for alexithymia and the somatization hypothesis is mixed. However, when the inhibition of emotion is examined psychophysiologically, there is support for the notion that suppressed emotion leads to somatic symptoms (e.g., Goldstein, Edelberg, Meier & Davis, 1988; Martin & Pihl, 1986). When suppressed emotions are given an opportunity for verbal expression, such as through writing about traumatic incidents in journal entries, significant changes have been found in health symptoms, frequency of medical visits and positive changes in immune system functioning (Pennebaker, Kiecolt-Glaser & Glaser, 1988). Beutler and his colleagues reviewed research on the links between the expression of intolerable feelings and symptoms of chronic pain and depression, suggesting that :

> "a) the prolonged blocking or inhibition of intense interpersonal anger may be a common correlate of depression, chronic pain, and disease susceptibility; b) blocked and suppressed emotional experience that coincides with prolonged stress may also result in deactivation of both endogenous opioids and natural killer cells, which in turn are associated with the ability to ward off disease, pain and depression." (Beutler, Engle, Oro'-Beutler & Daldrup, 1986, p.756).

Solomon (1987), in his review of literature on "psychoneuroimmunology", described an "immunosuppression-prone personality pattern" which he saw as rendering individuals more susceptible to suppressive influences on the immune system. He equated this personality pattern with alexithymia.

Research into alexithymia has been marred by inadequate and varied operationalizations of this construct (Bagby et al, 1988) and by viewing it as a personality trait as opposed to a specific coping behaviour (Ahrens & Deffner, 1986). Despite this, measures of alexithymia have been correlated with the clinical severity of classic psychosomatic illnesses such as ulcerative colitis (Keltikangas-Jarvinen, 1985), asthma (Kleiger & Dirks, 1980), and with other forms of these illnesses (Bagby et al, 1988). Moderate correlations have been found between measures of alexithymia and chronic pain (Catchlove, Cohen, Braha & Demers-Desrosiers, 1985; Postone, 1986; Sriram, Chaturvedi, Gopinath & Shanmugam, 1987). Blumer & Heilbronn (1982), in following up on the theoretical work of Engel (1959), described their "pain-prone" chronic pain patients as having traits comparable to those characterized by the alexithymia construct. Though alexithymia has been hypothesized as a psychological etiologic agent in RA (Achterberg-Lawlis,1982; Udelman and Udelman,1981), the only studies exploring this hypothesis to date (Vollhardt, Ackerman, Grayzel & Barland, 1982;Vollhardt, Ackerman & Shindledecker, 1986), are of dubious research value because conclusions have been either inferential, or derived from a questionnable measurement technique (Ahrens & Deffner, 1986).

A new measure of alexithymia, the Toronto Alexithymia Scale (Taylor, Ryan & Bagby, 1985) appears to have resolved some of the psychometric difficulties in earlier measures (Bagby, Taylor & Atkinson, 1988) while showing convergent validity with measures purported to be theoretically linked to alexithymia (Bagby et al, 1988). However, it is too early to draw definitive conclusions about the clinical validity of this construct and its links to "psychosomatic" illnesses such as RA. If one accepts the "somatization" hypothesis, alexithymia could be conceived of as a measure of one's cognitive ability to practice emotional self-regulation. The Toronto Alexithymia Scale will be used in the present study to test for relationships between quality of life in RA and alexithymia as a coping practice.

Coping Practices: Critical Conclusions

There appear to be a number of coping practices of RA patients which can contribute to a favourable quality of life. At this time, general models, taxonomies and measurement instruments of these practices continue to proliferate (e.g., Carver, Scheier & Weintraub, 1989) while debate has focused on issues such as the lack of consensus reflected in the semantic and theoretical limitations of the 'coping' concept (Tunks & Bellissimo, 1988). It would appear that RA patients are called upon to practice coping responses appropriate for both acute and chronic symptoms. It also appears that, despite growing evidence which suggests that RA patients develop habitual responses to their symptoms, most RA coping research persists in using adaptations of Lazarus and Folkman's Ways of Coping Checklist (1980). These adaptations, like the original measure, retrospectively assess a particular stressful time that the patient had with RA symptoms, requesting an account of the practices used at that time. Such a measurement approach clearly does not provide an assessment of practices used for the ongoing management of RA symptoms. Assessing coping style, in the manner operationalized by Brown and Nicassio (1987), permits a better measure of habitual coping practices, but restricts this assessment to two styles when a variety of practices are undoubtedly used.

Efforts to identify and classify the specific coping practices of individuals having RA have not been attempted though an early qualitative study of general coping practices (Wiener, 1975) pointed to a methodology that may enable researchers to step outside the limitations of the coping models and taxonomies presented here. This shall not be the goal of the present study since its efforts are aimed at a preliminary integration of selected aspects of the research undertaken in this area to date. The evaluation of coping practices in relation to other measures of coping, and to measures of RA quality of life, shall be limited to measures of short and long term health behaviours, coping style, and alexithymia. Again, this dimension of coping is hypothesized to relate to coping beliefs and to the final proposed coping dimension, resources.

Coping Resources

Coping can also be conceptualized as a process which is facilitated or inhibited by the presence or absence of certain intrapersonal or external resources. A resource based view of coping causally links the presence of certain valued personality and social resources in such a way as to suggest that the efficacy of coping relates directly to levels of those resources (Hobfoll, 1989). Resources, in this sense, are like reserves in a bank that can be drawn upon when needed. In the present study, the social context and the personality construct ,"hardiness", will be reviewed and tested as coping resources.

Illness Behaviour: The Social Context

Illness, as with most other human experiences, is a social phenomenon. Prior to the advent of any illness symptoms, potential patients have had innumerable opportunities to acquire, through social learning, the types of behaviours and cognitions that could be invoked as appropriate once the symptoms of illness are evident (Craig, 1986; Fordyce, 1986). There is little question that different cultures and subcultures respond in culture-specific fashion to pain and other symptoms of illness (Craig,1986; Kirmayer,1984).

Kirmayer (1986) suggested that, "Once a symptom is expressed it becomes communication." (p.124). As a form of communication, symptoms are subject to the contingencies of people put in the position of having to respond to this communication. Fordyce extended this position further,

> "The fact of chronicity (in illness) means that both the patient and those around him will have had to establish and persist in the exercise of many illness-related behaviors"(Fordyce, 1986; p. 57).

The primary social system of the sick individual not only responds behaviourally to its ill member, but it also influences illness-related cognitions which influence the individual beliefs and expectations regarding the illness and the behaviours required for its management (Leventhal, Leventhal & Nguyen, 1985; Mechanic, 1987). The physician's beliefs also play a crucial role in this respect (Simonton & Simonton, 1975).

The social dynamics involved in assuming, according and maintaining the "sick role" (Pilowsky, 1987) highlight the importance that interpersonal factors can play in facilitating or inhibiting the coping efforts of individuals suffering from illness. The "sick role" can be an attractive option for those individuals who find it difficult to cope with the normal exigencies of everyday life (Blackwell & Gutman, 1985, Ford, 1983). However, the sick role, while carrying with it a sense of legitimacy and entitlement to receive the care and assistance of others - and reduce the stigma of illness, can also maintain individuals in an excessively dependent state that negates their efforts to use personal efforts to cope with illness (Stoudemire & Sandhu, 1987). For example, the social system has been cited as an important influence on a patient's compliance with prescribed medications (Arluke, 1980;

Lorish et al, 1989). The sick individual is thus influenced to varying degrees by the beliefs and practices of his or her social context.

The family and other social systems, when faced with a member who is ill, are called upon to adapt to the change in functioning of this member and, concurrently, the social system itself (Dym, 1987). Among the changes a family with a chronically ill member must implement are: shifting family roles, relating successfully to the medical delivery system, integrating medical information into their own beliefs system, and understanding the implications of the illness for the future of the family (Baird & Doherty, 1986). This adaptation can be particularly difficult when the existing system is dysfunctional in its interactional structure, or when it is going through any of its normal developmental or transitional strains (Rolland, 1987).

In a dysfunctional family system, the presence of a symptomatic member may provide the system with the means of reestablishing an acceptable level of homeostasis or diversion from emotional conflict, albeit at the expense of that member's health (Sluzki, 1981). The family, and other primary social system, conditions which are considered to predispose the development and maintenance of psychosomatic symptoms - and its own dysfunction - are: a) overcloseness and enmeshment; b) rigidity; c) some form of vulnerability; d) conflict avoidance via the symptom; and e) reinforcement of the symptom (Turk, Flor & Rudy, 1987, p. 14). The family system characteristics which preceded or followed as a result of the illness shape the continuing development of the system while providing a context which can be health-promotive or illness-exacerbating for its chronically ill member.

Social Support: Coping Possibilities

Billings and Moos (1981) have suggested that the examination of an individual's coping resources provides an opportunity to understand that individual's context for coping. The general literature on stress and coping has viewed social support as as an important mediator of stress. Social support has been described by Thoits (1986) as coping assistance since this support parallels, though not necessarily duplicates, an individual's coping efforts. Thoits (1984) has also spoken of a lack of social support as contributing to a person's vulnerability to stress. This view, however, is simplistic given that some social interactions may not be satisfying or facilitative for successful coping (e.g. Abbey, Abramis & Caplan, 1985; Coyne & DeLongis, 1986). Describing social support as a psychological resource, Gentry and Kobasa (1984) proposed that this resource must be defined in terms of the perceptions that an individual has regarding the *quality* (authors' italics) of one's interpersonal relationships. People's sources of social support are often involved, usually unwittingly, in the maintenance and exacerbation of pain and illness (Delvey & Hopkins, 1982; Elliot, Trief & Stein, 1986; Flor, Kerns & Turk, 1987; Kerns & Turk, 1984, Turk & Rudy, 1987), including "support" provided by social institutions (Maruta, Swanson & Swenson, 1979; Painter, Seres & Newman, 1980). One's social "support" resources can thus play a role in promoting or inhibiting successful coping efforts.

A growing body of research has suggested that the availability and mobilization of social support is predictive of better health outcomes (Berkman, L.,1985; Cohen, 1988, Cohen & Wills, 1985; Kessler, Price & Wortman, 1985). This support either buffers the individual from the effects of stressful circumstances or provides beneficial outcomes irrespective of whether the individual is under stress (Cohen & Wills, 1985). While it is clear that skill is involved in acquiring and maintaining supportive relations (Wills, 1987; Hansson, Jones & Carpenter, 1985), the presence of this resource has been shown to buffer the effects of stress, when measures of social skill have been statistically controlled (Cohen, Sherrod & Clark, 1986). Good quality social support can provide the individual with: information that may facilitate coping, a source of empathy and outlet for expression of troubling emotions, a subculture in which to learn and practice health-enhancing behaviours, tangible support for physical and economic problems, health-facilitating norms and beliefs, and needed diversions from preoccupation with the stress of illness (Cohen, 1988). However, little empirical backing has been generated to elaborate, more specifically, how the efforts of family, friends, and others contribute to the health of and coping efforts of an ill person (Flor et al, 1987; Turk & Rudy, 1988). Still, Pearlin and Schooler (1979) dramatically concluded their seminal article, "The Structure of Coping", with the statement, "Coping failures, therefore, do not necessarily reflect the shortcoming of individuals; in a real sense they may represent the failure of social systems in which the individuals are enmeshed." (p.18)

Evaluations of the RA Patient's Social Context

The role that an RA patient's social environment plays in promoting or inhibiting effective coping is far from being understood. Research efforts in this respect are very recent and of questionable quality. One research team (Affleck et al, 1988), using a general measure of social support but no patient self-reports of psychological adjustment, found that RA patients who expressed a general satisfaction with their social supports were rated by other health care professionals as demonstrating superior psychosocial adjustment. In a study of 49 rural and urban families, with at least one member having an arthritis diagnosis, Imig and Sensen (1988) concluded that patients' self-reports of pain were correlated with family stressors such as financial concerns and (parental) managerial efficacy. Brenner et al, (Brenner, Panush, Longley, Edwards, Greer & Melamed,1988) from interview data of 40 RA patients, concluded that social support and optimism were significant predictors of life satisfaction while self-reports of less control over arthritis predicted problems in social interaction. In an early study of family support and RA patients' compliance with medical regimens, Ferguson and Bole (1979) found no link between family support and compliance. This conclusion has been challenged by the findings of Lorish et al (1989) who concluded that an absence of support contributed to compliance problems.

Varni and his colleagues (Varni, Wilcox & Hansen, 1988) studied the families of children diagnosed as having juvenile RA, assessing the parents' self-reports of their family's social support, the child's psychosocial adjustment, and medical ratings of disease activity. Using a small sample (n=23) and multivariate statistical procedures inappropriate for analysis of the obtained data, this research team concluded that family social support was a significant predictor of child psychological adjustment, even after controlling for disease activity.

Given that many RA patients are elderly, sources of social support are typically either spouses, with whom they may experience alleviations or exacerbations in their quality of life (Manne & Zautra, 1989), or the patients' adult children who typically provide relatively low levels of support (Cicirelli, 1981). Evidence from studies of chronic pain populations (e.g., Turk & Rudy, 1988), suggests that the quality of support from significant others does play a significant role in the amount of pain experienced. As yet, no empirical study has adequately examined the role that social support plays in the quality of life experienced by RA patients.

As suggested earlier, it is the subjectively perceived quality of the RA patient's social interactions that enable those interactions to be interpreted as facilitative. Research with chronic pain patients has consistently shown that certain forms of "help" from significant others is related to chronic pain maintenance (Flor, Turk & Kerns, 1987; Fordyce, 1976, 1988; Turk & Rudy, 1988). For example, patients receiving solicitous forms of support from their spouses reported lower degrees of physical comfort than those having interactions that distracted them from their pain (Flor et al, 1987). Manne and Zautra (1989) have shown that levels of criticism of the ill spouse by the non-ill spouse predicted lower degrees of physical comfort. Social support deficits have also been found to be predictive of noncompliance with treatment (Lorish et al, 1989). Wiener's (1975) examination of the qualitative experiences of RA patients suggests that a substantial coping task involves maintaining a facade of normality so as not to be a burden to one's immediate family and friends, despite the severe disruptions to the performance of basic household and family functions which have been linked to RA (Reisine et al, 1987). The importance of the types of social interaction between RA patients and their immediate social environment, as it relates to their quality of life, requires closer analysis. A general measure of support quality and measures of solicitous, distracting and punitive support received from one's most significant other ((Kerns, Turk & Rudy, 1985) will be used to assess social support resources in the present study.

Hardiness: A Personality Resource

Another way of viewing a RA patient's coping resources is to examine those enduring intrapersonal qualities, or personality traits, drawn upon when coping with the chronic symptoms of RA. RA is considered one of Alexander's (Alexander & Benedek,1950) classic psychosomatic illnesses. Moos (1964) reviewed personality data from studies of over 5000 patients, claiming that the notion of an individual predisposed to RA had not been extended, through research, past the circularity of this hypothesis (i.e., that studies had been retrospective as opposed to longitudinal and predictive). He noted that these studies had arrived at a consensual validation that a) RA patients tend to repress and control their feelings, b) they are shy and feel socially inadequate; and c) they are self-sacrificing and compulsive. Crown and Crown (1973) tried to discriminate the personality changes that could result from reactions to RA symptoms, from those personality factors that antedated the disease by comparing parents according to their degree of functional ability. They interpreted their findings as suggesting that no specific personality traits were directly related to the onset or reactions to RA. Spergel and his colleagues (Spergel, Ehrlich & Glass,1977) compared MMPI and Tennessee Self-Concept Scale scores of RA and other chronic illness patients. As a result, they concluded that the "arthritic personality" was a psychodiagnostic myth which should instead be viewed as one form of chronic disease personality attributable to the disease process. Years of effort to identify personality or coping factors which predispose individuals to RA have resulted in no conclusive evidence. However, there have been findings suggesting that traumatic life events or psychological conflicts often precede the onset of RA (Baker,1982; Cioppa & Thal,1975; Diamond, 1984; Rimon,1981). The above studies have tended to view the role of personality factors in RA from a pathological perspective, overlooking the personality resources which may facilitate coping.

Coping research now examines "healthy" personality traits and their relationship to coping coutcomes. There has been a recent attempt to resurrect studies of the relationships between personality traits and health using the construct of "hardiness". Kobasa (1979) examined certain personality factors of middle and upper level executives and found that, despite comparable levels of exposure to stressful circumstances, these personality factors were predictive of health symptoms. More specifically, the personality factors predictive of good health were: 1) a strong commitment to self, 2) an attitude of vigorousness toward the environment, 3) a sense of meaningfulness, and 4) an internal locus of control. These have since been correspondingly reduced to operationalized measures of an individual's commitment, control and challenge. Kobasa termed these factors "hardiness", a personality disposition having both cognitive appraisal and action aspects. Rhodewalt and Zone (1989), in support of the hardiness construct, concluded that "nonhardy" individuals viewed similar negative life experiences less favourably than did "hardy" individuals. Similarly, Alldred and Smith (1989) reported that "nonhardy" individuals endorsed more negative self-statements than did "hardy" individuals when faced with stressful conditions.

"Hardiness" should apparently function as an intrapersonal stress-resistance resource that promotes effective coping. Kobasa and Puccetti (1983) examined the role that "hardiness" and social resources played in stress resistance and found that, while hardiness remained predictive of stress resistance, only one form of social resource (boss support) contributed to stress resistance. When "hardiness" was examined as a factor in the psychological adjustment of patients to three chronic illnesses (RA diabetes and cancer), Pollock (1986) concluded that her measure of hardiness was predictive of adjustment in the most controllable of these illnesses, diabetes. Using the Kobasa measure of hardiness, a measure not adapted for the study of chronic illness, Okun et al (Okun, Zautra & Robinson, 1988) were unable to obtain significant correlations between this measure and measures of physical comfort and functional ability in a sample of RA patients. Hardiness, despite the early promise in stress research, has yet to be identified as a factor in predicting physical comfort and functional ability in RA patients.

Hardiness, and its operationalizations, has not been accepted wholeheartedly by coping researchers. Alldred and Smith (1989) have suggested that "hardiness" measures are contaminated with neuroticism. Hull et al (Hull, Van Treuren & Virnelli, 1987) have been more harsh in their assessment of the "hardiness" construct and its measures. They and later research teams (Alldred & Smith, 1989; Rhodewalt & Zone, 1989) have inferred from their studies that it is a lack of "hardiness" which is more predictive of health symptoms rather than the presence of hardiness. Additionally, Hull et al (1989), in examining the psychometric quality of "hardiness" measures, have concluded that: a) "hardiness" is not a unitary measure and b) the "challenge" subscale is nonpredictive of health outcomes. There was no assessment provided of the Pollock (1986) Health-Related Hardiness Scale used in this study.

While refinements are needed in the measurement of personality traits and their relationship to health, there still remains ample evidence to suggest that certain personality traits, including "hardiness" are predictive of health outcomes (Eysenck, 1988; Folkman et al, 1986b; Friedman & Booth-Kewley, 1987). It appears as though personality traits can function as intrapersonal resources which favourably or negatively predispose an individual to certain health outcomes. It remains to be seen if the "hardy" RA patients experience a better quality of life than "nonhardy" RA patients. The Pollock (1986) "health-related hardiness" scale shall be used in the presnt study to test for this measure's degree of association with RA patients' quality of life.

Coping Resources: Critical Conclusion

Coping resources, theoretically, should contribute to an individual's ability to cope. However, an inadequacy of most resource conceptualizations of coping is that they present a static perspective of the coping process which fails to address how the resources are acquired, maintained, and mobilized when needed (e.g., Hansson et al, 1985). Preliminary attempts to study connections between individuals' coping resources and practices have indicated modest relationships (e.g., DeLongis et al, 1988; Lefcourt, Martin & Saleh, 1984), but theoretical models acknowledging the importance of both are rare. Similarly, in most theories where stress-coping resources have been considered, they have been limited to either intrapersonal or interpersonal resources (e.g., Cohen, 1988; Kobasa et al, 1982), with few studies examining the relationship between the two (DeLongis et al, 1988; Kobasa & Puccetti, 1983). In the model of coping proposed by Gentry and Kobasa (1984) the personality resource of hardiness is hypothesized to be positively and negatively affected by the perceived quality of social interactions. This emphasizes hardiness as a coping resource which should therefore be viewed as intra- and inter-personal. The present study may enable some conclusions to be drawn regarding this hypothesized relationship and the role that both forms of coping resources play in the quality of life of RA patients.

More encompassing resource models of coping have been researched and offer fragmentary and tentative insights. For example, DeLongis and her colleagues (DeLongis, Lazarus & Folkman, 1988) found that a combination of social and intrapersonal resources predicted the degree to which individuals experienced psychological and somatic symptoms. Dunkel-Schetter et al (Dunkel-Schetter, Folkman & Lazarus, 1987) concluded that intrapersonal factors such as coping style, beliefs regarding support receipt and the perceived severity of the stressor influenced the mobilization of support and the resultant psychological outcomes. Ruehlman and Wolchik (1988) indicated that undergraduates who reported support from an important other person, and were highly involved in goal-oriented activities (completion of a project), reported a greater sense of well-being. Holohan and Moos (1985) divided a community sample into distressed and stress-resistant groups, concluding that an easy going disposition in combination with a nonavoidant coping style predicted membership in the stress-resistant group. They also inferred from their data that men with greater self-confidence and women with better family support were in the stress-resistant group. To date, accounting for the complexities involved in the relationships between intrapersonal characteristics, social support mobilization, and resultant quality of life outcomes seems beyond the scope of current research methodology. Piecemeal understandings will have to suffice in the meanwhile.

A resource-based approach to coping research provides an opportunity to understand the context in which people cope. It is conceivable that a person is capable of performing certain coping practices which could lead to favourable quality of life outcomes, but that because of an interpersonal context or intrapersonal qualities, they would be inhibited in using those practices. Similarly, a person may shift beliefs in certain interpersonal contexts, conceivably giving up the health-enhancing qualities those prior beliefs had promoted. The extent to which coping resources influence RA patients' coping practices, and coping beliefs remains an unknown. Furthermore, there has been no prior analysis of the discrete contribution that coping resources might make to RA patients' quality of life when measures of these resources are taken concurrently with measures of coping beliefs and coping practices. The selection of coping resources in this study has been limited to measures of quality of social support from a significant other and the personality trait, "health-related hardiness".

Psychoeducational Interventions to Enhance Coping

The choice of coping measures included in this study, as operationalizations of the constructs they have been derived from, has been made because psychoeducational treatments have promoted, or been hypothesized to promote improvements on these measures with corresponding improvements on quality of life measures. However, in many cases, research into the effects of psychoeducational treatment of RA patients is recent and has not specifically studied coping measure changes resulting from treatment. The review of psychoeducational treatment studies with RA patients which follows is an attempt to provide a pedagogical rationale for studying the naturally occuring coping responses of RA patients.

The use of psychoeducational interventions as part of the treatment for RA patients is relatively recent. The primary intervention has been patient education. Reviews of the efficacy of patient education (Lorig et al, 1985; Lorig et al, 1987; Mullen et al, 1987) have been generally favourable, though methodological weaknesses have been common to many of the studies measuring the effects of patient education. One recent study, meeting more rigorous design standards, supports these general findings (Goeppinger, Arthur, Baglioni, Brunk & Brunner, 1989). Patients who have participated in educational programs have demonstrated increases in treatment adherence, decreases in pain, disability and depression (Mullen et al, 1987), as well as increases in illness-related knowledge, recommended behaviours and lessened pain (Lorig et al, 1985).

Some psychoeducational interventions have focused on general stress management, group counselling, or social skill training (Kaplan & Kozin, 1981, Shearn & Fireman, 1985; Strauss, Spiegel, Daniels, Landsverk, Roy-Byrne, Edelstein, Elhardt, Fale, Hindin & Zackler, 1984; Udelman & Udelman, 1978). The results of these interventions were statistically negligible or reported anecdotally (Udelman & Udelman, 1978).

Another form of intervention has been the use of biofeedback (Achterberg et al, 1981; Flor et al, 1985; Varni, 1981;Wickramsekera et al, 1976). In the earliest of these studies (Wickramsekera et al, 1976) no definite conclusions could be drawn. Achterberg and her colleagues (Achterberg et al, 1981) found that biofeedback alone did not generally lead to improvements in psychological mood, but a combination of relaxation training and biofeedback resulted in superior positive outcomes. Varni (1981), in a single subject case study design, used biofeedback, in combination relaxation training and imagery techniques, and found that his two hemophilia arthritis patients were able to achieve clinically significant reductions in pain perception. A similar single subject study, without biofeedback (Varni & Gilbert, 1982) produced decreases in pain intensity and medication intake. Flor et al, (1985) compared biofeedback, a credible pseudotherapy, and conventional medical treatment for patients with chronic rheumatic back pain. At the end of the four week treatment phase and at the four month followup, the patients in the biofeedback group reported significant improvements in the duration, intensity, and quality of their back pain. No significant improvements were found for the two other groups of patients. Biofeedback appears to be an intervention which, in combination with other interventions, can assist patients in better coping with RA.

The most promising psychoeducational approach appears to be cognitive-behavioural therapy which is based on interventions developed for chronic pain patients (e.g. Turk et al, 1983). Such interventions tend to concentrate on the development of beliefs, practices and resources suggested by models such as that of Lazarus and Folkman. These interventions have resulted in improvements in psychosocial adjustment and pain reduction (Appelbaum, Blanchard, Hickling & Alfonso, 1988; Bradley et al, 1987; Lorig et al, 1989; O'Leary et al, 1989), reduction in pain behaviours with increases in functional ability (Appelbaum et al, 1988; Bradley et al, 1987), inferred or measured differences in self-efficacy (Lorig et al, 1989; O'Leary et al, 1989; Parker et al, 1988), improvements in disease activity (Bradley et al, 1987; O'Leary et al, 1989), and increased practice of coping strategies (Parker et al, 1988). These improvements have been noted over time well after the interventions (Bradley et al, 1987; Parker et al, 1988). It would thus appear that coping skills can be learned and do make a difference in the psychosocial and physical adjustment of RA patients to their illness.

Coping Research: Conclusions

Adequately accounting for the complexities and idiosyncracies of coping, in all the situations where coping is called for in chronic illness, has been an evolutionary process for almost three decades, with little unaninimity as to what constitutes 'coping' (Tunks & Bellissimo, 1988). A confusing array of models, measurement instruments, and research findings has evolved making it difficult for the health-care practitioners to benefit from the outcomes of this research when designing and modifying psychoeducational treatments with chronic illness populations.

In the case of RA patients, the results are even more tentative, though preliminary findings suggest that certain coping variables, amenable to psychoeducational treatment, have been found to correlate with quality of life outcomes. The present study has been designed to measure relationships between measures of coping beliefs, coping practices, and coping resources and two quality of life indices: physical comfort and functional ability. The author has chosen to select measures which reflect these divisions in coping and quality of life in an attempt to identify associations between measures of broad categories of coping responses and quality of life for RA patients. Most approaches to coping have generated results which are piecemeal and offer little understanding of the interrelationship between such broad dimensions of coping as those proposed in this study. The statistical procedure of factor analysis will enable the researcher to determine if these coping dimensions are a meaningful way to classify coping with RA.

This study seeks a selective integration of the status quo in coping research with RA patients. From this study's analyses, it will be possible to reduce the number of coping measures to fewer distinct underlying constructs. This will further assist in reducing the complexity of the growing array of coping measures from which those included in the present study have been selected. There are weaknesses in this approach to studying coping and quality of life in RA: many relevant variables from each of these divisions have, necessarily been left out for reasons of practicality; the measurement instruments selected have adequate psychometric properties though their clinical utility is still in the process of being proven (Tunks & Bellissimo, 1988); and this research will yield generalizations about coping and quality of life where significant individual differences will be obscured. Choosing to use subjective measures, while fully aware of the active debate going on within psychology regarding this approach of stress and coping measurement (e.g. Dohrenwend, 1985; Lazarus, DeLongis, Folkman & Gruen, 1985) is a matter which will be addressed in the following chapter. But, these forms of coping and stress measures are the state of the art in this type of research. Still, there is a need for an initial integration of research into coping and quality of life in RA, such as that undertaken in this study, so that the longer range task of developing a comprehensive understanding of the relationships between patients' coping beliefs, coping practices, coping resources, medical treatment and quality of life can be more clearly explicated.

It would appear that conceptual approaches to describing illness behaviour (Cohen, 1989; Mechanic, 1987; Moos & Schaefer, 1984; Nerenz & Leventhal, 1983) are perhaps too complicated to operationalize for research purposes, and that some of the generalizations may not hold across different illness populations. Still, the approach to studying patients' coping responses used in the present study does point the way to more comprehensive research in this area, perhaps allowing for the identification of new factors previously unseen or viewed as irrelevant to coping. The constructs to be evaluated in the coping dimensions of the present study reflect an effort to move towards a more comprehensive account of factors involved in coping with RA.

Summary

RA is a capricious disease which presents a combination of chronically painful and disabling symptoms over an illness course fraught with uncertainty. Coping with RA and its related psychosocial concomitants involves using beliefs, practices and resources which, while having similarities to the coping responses called for in other stressful circumstances, are unique to RA. Research into the benefits that coping beliefs, practices and resources can have for the two areas of quality of life primarily affected by RA, physical comfort and functional ability, has been fragmentary but encouraging. Even more encouraging, is evidence suggesting that coping beliefs, practices and resources are favourably amenable to psychoeducational interventions, and that these interventions can lead to improvements in RA patients' quality of life. To date, research in this field has not been integrative. As a result, it is hard to understand in a comprehensive way the potential role that coping beliefs, practices, and resources play, collectively and uniquely, in the quality of life experienced by RA patients. Should a more comprehensive understanding become available to health care practitioners regarding the role that these coping factors play in RA patients' quality of life, important areas for potential treatment will have been identified.

Chapter III

Method

The purpose of this study is to examine relationships between coping and quality of life variables in individuals having rheumatoid arthritis (RA). The coping variables were evaluated using self-report measures characteristic of three proposed coping dimensions: beliefs, practices, and resources. Quality of life was assessed using self-report measures of physical comfort and functional ability. Quality of life is assumed to encompass a much broader range of patient experience than is assessed by these measures. Research in this field has resulted in a proliferation of coping variables which have been found (or hypothesized) to relate to indices of quality of life in RA patients. To date, no effort has been made to integrate this increasingly complicated array of coping variables in such a way as to provide a preliminary overview of the relationship between these and quality of life variables. This study thus aims to integrate research on the relationships among coping and quality of life variables as they pertain to RA patients.

To conduct this study, and meet the above objective, it was necessary to make decisions regarding the variables to be examined. The following criteria were used to select the variables assessed in this research:

1. The variables should be of such a nature that they can be targeted for psycho-educational interventions. For example, an individual lacking quality social support may be assisted to expand and enhance supportive relationships with others.

2. The variables must have been operationalized using self-report measures which have demonstrated adequate psychometric properties.

3. The variables, and their related measures, should reflect the three conceptualized forms of coping (beliefs, practices, resources) and two forms of quality of life for RA patients (physical comfort and functional ability).

4. The coping measures have been shown (or hypothesized) to relate to measures of RA patients' quality of life.

5. The aggregate number of items resulting from the inclusion of the selected measures would not exceed an approximate total of 200 items.

Hypotheses

On the basis of the literature reviewed, the following hypotheses are put forth:

1. Significant relationships will be found between measures of coping; representing beliefs, practices, and resources coping dimensions; and quality of life measures for RA patients.

2. Factor analysis of the coping measures shall produce a parsimonious account of factors corresponding to the hypothesized coping dimensions and related to the two quality of life measures.

3. Measures from each coping dimension will contribute to our ability to predict general physical comfort and functional ability.

The following arbitrary classifications of the study's subjects have been made according to their scores above and below the mean score on the coping and quality of life measures.

a) physical comfort versus physical discomfort
b) functional ability versus functional disability
c) active versus passive coping styles
d) treatment compliant versus treatment resistant

Mean scores on these measures were selected as the division point because there were insufficient numbers of participants to warrant a division made at one standard deviation above and below the mean score for each measure.

4. From linear combinations of scores on certain coping measures it will be possible to discriminate subjects into physically comfortable and physically discomforted groups.

5. From linear combinations of scores on certain coping measures it will be possible to discriminate subjects into functionally able and functionally disable groups.

6. From linear combinations of scores on certain coping and quality of life measures it will be possible to discriminate subjects into those reporting active or passive coping styles.

7. From linear combinations of scores on certain coping and quality of life measures it will be possible to discriminate subjects into those reporting treatment compliance or treatment resistance.

Sample

Two hundred and forty-four volunteers, reporting a diagnosis of RA participated in the study. Volunteers were excluded if they met the following criteria:

1. they reported no medical diagnosis of RA
2. they reported recent surgery or were in the process of recovering from a recent physical accident.
3. they reported another concurrent illness that was severe such as cancer or heart problems.

Population locale was restricted to Alberta and the Northwest Territories. This was primarily a matter of convenience, but in doing so the population can be considered homogeneous in terms of their exposure to climatological factors which have been shown to relate to the RA patients' experience of their symptoms (Williams & McCarty, 1985).

Variables

In addition to the conceptualizations of coping and quality of life reviewed there are specific definitions used to describe and operationalize the research variables: rheumatoid arthritis (RA) patient, physical comfort, functional ability, arthritis self-efficacy, arthritis "helplessness", coping style (active and passive coping), alexithymia, health related "hardiness", social support, treatment compliance or treatment resistance, coping behaviours (general and RA-specific) and medical treatment. These are described in greater detail as follows:

1. Rheumatoid arthritis patients are those individuals who have been diagnosed by a physician or medical specialist as having symptoms meeting the guidelines established by the 1987 American Rheumatism Association's revised criteria for the classification of rheumatoid arthritis (Arnett et al, 1988). This diagnosis will be indicated by the self-reports of individuals participating in the study.

2. Physical comfort shall be defined as the sum score of the items of The Activities of Daily Living Pain Scale (Callahan, Brooks, Sumney & Pincus, 1987).

3. Functional ability shall refer to a patient's capacities to perform certain daily physical activities. A subject's composite score on the physical function factor (Mason, Anderson & Meenan, 1988) of the Arthritis Impact Measurement Scales (Meenan, Gertman & Mason, 1980) shall indicate the degree of a patient's functional ability.

4. Arthritis self-efficacy measures an individual's belief in the capacity to control RA symptoms. A subject's composite score on the Arthritis Self-Efficacy Scales (Lorig et al,1988) shall be used as the definition of arthritis self-efficacy.

5. Arthritis "helplessness" is a construct borrowed from the learned helplessness theory of Seligman and his colleagues (Abramson et al, 1978; Seligman, 1980). In this study, "helplessness" will be measured by a subject's composite score on the "helplessness" subscale (Stein et al, 1988a) of the the Arthritis Helplessness Index (Nicassio, Wallston, Callahan, Herbert & Pincus, 1985).

6. Coping style refers to a RA patient's self-reported use of an active or passive pattern of coping practices for managing the symptoms of his or her illness. This pattern shall be measured by a subject's composite scores on the Vanderbilt Pain Measurement Inventory (Brown and Nicassio, 1987) Active and Passive coping subscales.

7. Alexithymia refers to the practice of recognizing and expressing affective experience (Taylor, 1984). For the purposes of this study, alexithymia shall be defined as a subject's composite score on the Toronto Alexithymia Scale (Taylor et al, 1985).

7. Health-related "hardiness" is a construct borrowed from the stress coping research of Kobasa and her colleagues (Kobasa, 1979; Kobasa et al, 1982). Pollock (1986) operationalized this construct for researching patients' coping with the stress of chronic illness. Subjects' composite scores on Pollock's Health-Related Hardiness Scale shall define health-related "hardiness".

8. Perceived social support shall refer to the types of interpersonal assistance that RA patients report they receive from a specified significant other, usually a spouse. Composite scores on the "support", "solicitous responses", "distracting responses", and "punishing responses" subscales of the West Haven-Yale Multidimensional Pain Inventory (Kerns, Turk & Rudy, 1985) shall define a subject's quality of social support.

9. Treatment compliance shall be defined as subjects' responses which indicate full compliance on two specific questionnaire items measuring compliance with

prescribed medication and physical exercise regimens. Treatment noncompliance shall be regarded as any response indicating less than full compliance on these two questionnaire items.

10. Coping behaviours will refer to responses to two categories of self-report items on the questionnaire. The first category shall refer to the subjects' responses to items measuring the practice of behaviours considered to enhance their general level of health (e.g. participation in physical activity) while the second category shall refer to patients' responses to items measuring participation and choice of behaviours hypothesized to enhance coping with the symptoms of RA. In some cases these items asked respondents open-ended questions for which written responses were necessary. For example, participants were questioned regarding other medical conditions they may be experiencing. Their responses on this item, were classified according to levels of severity of the conditions reported, a procedure undertaken following consultations with a physician. A similar question was asked regarding the medications taken by respondents. The other open-ended questions were asked as a means of getting descriptive information regarding the patients' coping and quality of life. Their responses on these items were not used for analysis.

11. Medical Treatment shall refer to any treatment prescribed by a medical specialist or physician. This includes prescribed pharmaceutical treatments (aspirin to injections of gold or penicillamine), surgery, physical therapy and exercise, diets, or use of other treatment devices (splints, canes, etc.). Responses to items asking for descriptions of past and current medical treatment shall be considered as defining "medical treatment".

Measures

Measures of Quality of Life

Decisions in this study were made to use self-report measures of the patients' quality of life, specific to the areas of patients' physical comfort and functional ability. While there is evidence to suggest that these types of instruments are valid clinical measures which can be used for both diagnostic and treatment evaluation purposes (Chambers, 1983; Meenan et al, 1984; Meenan & Pincus, 1988; Nelson, Conger, Douglass, Gephart, Kirk, Page, Clark, Johnson, Stone, Wasson, & Zubkoff, 1983), their use with rheumatology patients has been limited and recent. Choosing self-report versus more traditional measures of patient health status was both a pragmatic decision and one based on the importance of patients' subjective perceptions of their quality of life to this study. Criticisms of these types of measures have generally emphasized patients' propensities for distorted self-evaluation because of psychological factors (Costa & McCrae, 1985; Spiegel, Leake, Spiegel, Paulus, Kane, Ward & Ware, 1988) or favourable self-presentation (Hogan & Nicholson, 1988). At the heart of the debate regarding the validity of self-report versus more objective measures of health status are the emphases given to the "objectivity" of symptoms or stressors. This debate has taken place openly and recently in the American Psychological Association's flagship journal, the "American Psychologist" (Dohrenwend & Shrout, 1985; Lazarus, DeLongis, Folkman & Gruen, 1985), with no successful resolution.

Choosing to use self-report measures of quality of life is consistent with the position taken by Lazarus and his colleagues (Lazarus et al, 1985; Lazarus & Folkman, 1984), that it is the global subjective experience of the stress of living with RA, of which the psychological concomitants and objectively observed physical symptoms are both a part, that is key to understanding how one copes and lives with RA. However, until more data is available regarding the validity of these self-report instruments, no conclusions can be made regarding the degree to which they accurately assess patient health status. A delimitation of this study will therefore be that it can not provide a cross-validation of the accuracy of patient self-reports on the quality of life instruments with more objective measures of health status used in traditional medical practice (e.g., Gresham, 1987).

The assessment of physical comfort, or pain, in RA underscores the importance of the previous discussion. How pain is measured in RA appears to play a substantial role in interpreting the results obtained (Skevington, 1986). Traditionally, pain was assessed using "objective" measures such as dolorimeters and estimates of disease severity, but these have steadily given way to an increased use of self-report measures such as the McGill Pain Questionnaire and Visual Analogue Scales. Such measures are a window into the subjective experiences of individuals suffering from pain, but fail to satisfy the criteria desired by scientists striving for objectivity in pain assessment (e.g., Clark, 1984; Gracely, 1983).

There are limitations to these approaches as well, primarily because of the fluctuations in pain at different times of the day or stages of the illness (Callahan et al, 1988). For example, Moldofsky and Chester (1970) found that dolorimeter measurements of arthritic pain were subject to mood change patterns, a finding later replicated on self-report scales (Langley, G.B. & Sheppeard, H.,1985). Charter and his colleagues (Charter, Nehemkis, Keenan, Person & Prete, 1985) found that emotional intensity was more salient to patients than the sensory intensity of arthritic pain when measured by the McGill Pain Questionnaire and Visual Analogue Scales. Badley and Papageorgiou (1989) found differences in

RA patients' Visual Analogue Scale self-reports of pain in joints while at rest and during movement. Using, the McGill Pain Questionnaire these researchers (Papageorgiou & Badley, 1989) found differences in RA patients' choices of qualitative descriptors selected for joint pain and overall pain at rest and on movement. To understand the influence that physical comfort has in an individual's quality of life, one's subjective experience in this regard must be examined. Rather than seeing self-reports of pain as "noisy sources of information" (Clark, 1984), these reports should be viewed as evidence of the degree to which lack of physical comfort interferes with the general quality of life.

The following two quality of life measures are reported, in full, in Appendix A (Responses to Rheumatoid Arthritis Questionnaire).

The Activities of Daily Living (ADL) Pain Scale (Callahan et al, 1987). This nine item scale addresses some of the above concerns by assessing the frequency with which arthritis patients experience pain in their daily activities and using a visual analogue scale to indicate the severity of pain over the past week. The items can account for the variability in arthritic pain experienced during the course of eight normal daily activities (e.g. dressing oneself, getting in and out of a car, bending down to pick something up form the floor etc). Alpha coefficients derived from a sample of 330 patients indicate a range from 0.74 to 0.85 for the first eight items. Test-retest (n = 133) reliabilities ranged from 0.65 to 0.81. No composite scale alpha coefficient or test-retest reliability scores were available to the researcher. The single visual analogue scale item is a widely used measure in all forms of pain research and asks the patient to rate the severity of his or her pain on a ten centimetre horizontal scale indicating "no pain" on one end to "Pain as bad as it could be" on the other. A converted score is then calculated by measuring where the patient has indicated his or her pain severity to be on this pain continuum and this score is added to the aggregate score of the previous eight items. A respondent's composite score on the Activities of Daily Living Pain Scale was used, for analysis in the present study.

Arthritis Impact Measurement Scales - Physical Function Factor (AIMSPF) (Meenan, Gertman & Mason, 1980). This patient health status instrument measures (47 items were selected for use in the present study though only 26 were included for analysis), by self-report, various patient functional capacities. In a recent editorial Meenan and Pincus (1988) wrote of patient status instruments, including the AIMS, as demonstrating that: "the measurement properties of the new questionnaires exceed those of older, cruder, functional measures such as the ARA Functional Classification." Furthermore, the new measures have been shown to equal the performance of traditional patient status measures such as joint count, grip strength and walk time. (Meenan et al, 1984). In the present study, the AIMS functional ability factor will be used. It is considered to be the sum of scores from the Mobility, Physical Activity, Household Activities, Activities of Daily Living and Dexterity subscales of the full scale AIMS. These subscales, combine to form a physical function factor as revealed by recent factor analysis (Mason et al,1988).Collectively, these subscales are shown as the Physical Function Factor in the Responses to Rheumatoid Arthritis Questionnaire shown in Appendix A. No psychometric data was available regarding the internal consistency or tet-retest reliability of this factor. The Pain. Social Activity, Depression, Anxiety and Health Perceptions subscales were included in the questionnaire although responses on these subscales were not included for analysis. Composite scores on the AIMS Physical Function Factor were regarded as the measure of functional ability used in the present study.

Coping Measures

The measures used to assess the dimensions of coping conceptualized in this study also rely on patient self-report. For a more detailed understanding of these measures, the reader is referred to the Responses to Rheumatoid Arthritis Questionnaire reported in Appendix A.

Arthritis Self-Efficacy Scale (Lorig et al, 1988). This self-report scale consists of 20 items which measure three distinct factors using the following subscales: Self-Efficacy Pain (PSE), Self-Efficacy Function (FSE), and Self-Efficacy Other Symptoms (OSE). The scale was derived from the social learning theory of Albert Bandura (1982) which holds that self-efficacy is one's conviction that he or she can perform certain behaviours to achieve specific outcomes. In the case of RA, this would refer to a patient's ability to manage symptoms of the disease. The scale was developed using the input of a rheumatologist, RA patient groups which assessed the rheumatologist's items and then modified or offered their own, preliminary testing of RA patients to assess item suitability, and finally, alterations made to produce the current scale. This scale is a modification of an earlier scale developed by Shoor and Holman (1984). Based on a sample population of 221 subjects with RA and other arthritis diagnoses, coefficient alpha estimates for the three factors ranged between 0.75 to 0.90, while test-retest reliabilities ranged between 0.85 to 0.91. Unfortunately, no full scale alpha coefficient or test-retest reliabilty data was available. The full scale Arthritis Self-Efficacy Scales was used in this study and respondents' composite scores on the scale were used for analysis.

The Arthritis Helplessness Index ("helplessness") (Nicassio et al, 1985) scale was developed to measure the beliefs that RA patients had regarding the degree to which they felt they had control over their symptoms. This scale was developed as an RA-specific operationalization of Seligman's (Abramson et al, 1978; Seligman, 1980) learned helplessness theory of depression. Factor analysis has suggested that the Arthritis Helplessness Index consists of two belief subscales which apparently measure opposite constructs (Stein et al, 1988a). These two subscales are the five item "helplessness" subscale and the ten item "internality" subscale. Follow-up tests using the "helplessness" factor have demonstrated significant correlations with levels of disease activity and quality of life for RA patients (Stein et al, 1988b). A composite score on the "helplessness" factor shall be used in this study and has an been found to have internal consistency of 0.63.

Vanderbilt Pain Management Inventory (Brown & Nicassio, 1987) This 18 item pain-coping measure assesses two styles of pain-management: active and passive coping. The active coping subscale consists of 7 items and demonstrated an alpha coefficient of 0.71 and test-retest reliablity of 0.65; while passive coping has 11 items and showed an alpha coefficient of 0.82 and test-retest reliability of 0.69 (n=361 RA patients). The authors found that active coping was correlated with greater internal health locus of control and general self-efficacy, and lower depression, helplessness, pain and functional impairment in arthritis patients. Alternatively, passive coping was consistently related to poorer adjustment. (Brown et al, 1988). Though this scale has been developed specifically as a measure of pain coping practices, the inter-relationship between pain and functional ability suggests that practices used for coping with pain may also assist in coping with disability (e.g, Keefe et al,1987). Composite scores on the Active and Passive Coping subscales of the Vanderbilt Pain Management Inventory were used for analysis.

Toronto Alexithymia Scale (TAS) (Taylor, Ryan & Bagby, 1985) This is a 26 item, 5 - point likert, self-report scale which demonstrated an internal consistentency, or coefficient alpha of 0.79 and one-week (0.82) and five-week

(0.75) test-retest reliabilities. Items reflect the substantive domain of the construct: 1) difficulty in describing feelings, 2) difficulty in distinguishing between feelings and bodily sensations, 3) lack of introspection, 4) social conformity, and 5) impoverished fantasy life and poor dream recall. Factor analysis of the TAS produced a 4 factor solution congruent with the alexithymia construct. The first 3 of these factors (difficulty identifying and distinguishing between feelings and bodily sensations, difficulty communicating feelings, and reduced daydreaming) are central to previously described alexithymia characteristics, while the fourth (externally-oriented thinking) has received less theoretical attention. In a recent comparison of the most commonly used alexithymia scales, based on administrations with 209 college students, Bagby et al, (1988) found the TAS to be the most internally consistent and sensitive to psychosomatic symptoms. In terms of construct validity, the TAS was found to be modestly and positively correlated with measures of daydreaming, attentional control, ego strength, anger expression, and functional somatic symptoms (Bagby, Taylor & Parker, 1988). The TAS, as used here, is a measure of an individual's capacity to emotionally cope and shall be considered as the respondents' sum scores on the full scale TAS.

Health-Related Hardiness Scale (HRHS) (Pollock, 1986) The HRHS was developed to measure the hardiness characteristic in the chronically ill. This scale consists of 48 items using a 6-point Likert scale. The items and subscales (commitment, 15 items; challenge, 15 items; and control, 18 items) have been derived from Kobasa's (1979) hardiness construct, an attempt to account for the good physical and psychological health of executives in stressful positions. Items for the HRHS were selected by a panel of 10 judges and then evaluated by faculty members and doctoral students with expertise in adult health as to their appropriateness for measuring "hardiness" in the chronically ill. The HRHS has an alpha coefficient for the total scale of 0.86, while the test-retest reliability for the HRHS was .9 for two weeks and .8 for three months (n=30).

West Haven-Yale Multidimensional Pain Inventory (WHYMPI) (Kerns et al, 1985) As its name suggests, this is a scale which purports to measure a number of dimensions related to living with pain. For the purpose of this study, only the WHYMPI subscales measuring perceptions of support from a significant other and perception of general support will be used. While there are a wide range of general social support measures which assess both the functions and structural properties of social support (Cohen & Wills, 1985), none, according to the author's awareness, other than the WHYMPI, has been specifically developed to examine the role which social support plays in the experience of chronic pain. This being the case, the following subscales of the WHYMPI were included in the measures used for this study: "support", "solicitous reponses", "distracting responses", and "punishing responses".

The differentiation of social support in this manner is important in examining chronic pain given the findings of Fordyce (1976) that some forms of social support reinforce pain behavior, thus reinforcing the experience of pain. Flor et al (1987), using these subscales, concluded that almost one third of the variance in chronic patients' pain reports and activity levels was attributable to forms of spousal reinforcement. Furthermore, Turk and Rudy (1988) were able to distinguish a classification of chronic pain patients they labelled as "interpersonally distressed" on the basis of scores on the above WHYMPI subscales. The "support" subscale contains three items with an internal consistency of 0.83 and a two week test-retest reliability of 0.80. The "solicitous responses" subscale has six items with a Cronbach's alpha rating of 0.78 and two week test-retest reliability of 0.89. Similarly, the four item "punishing responses" has a Cronbach alpha rating of 0.84 and test-retest of 0.84, while the four item "distracting responses" has 0.74 and 0.62 for the aforementioned ratings. In total, the above four subscales, consisting of seventeen items, shall be used to measure the degree to which social support plays a role in the health behaviours of RA patients.

General and Specific Coping Practices. A number of specific items (9) have been developed by the researcher for this study to assess participants' preferences for different forms of general health practices or RA-specific health practices. These items combine multiple choice response items with items that ask for an open-ended account of practices engaged in by the patient. Included in these questions are items on medical treatment compliance. Responses on the open-ended items were classified into prespecified categories. Categories were developed for severity of other forms of medical conditions, in consultation with a physician involved in supervising this study. Categories for classifying forms of health behaviour were developed by the researcher and are shown in the figures of Appendix C.

Demographic questions: General information regarding such data as the patient's age, marital status, general income category, level of education, length of illness, concurrent medical conditions, prescribed medications, and level of disease activity are asked on the questionnaire (13 items).

There are a total of two hundred and five items on the questionnaire used in this study. (see Appendix A). Actual and possible range scores for the scaales are reported in Table 2 of Appendix B.

Procedures

Rheumatoid arthritis patients primarily living in Alberta were canvassed for their participation in this study in a variety of ways. These individuals were initially recruited by poster and direct solicitation at the Rheumatology Clinic at the University of Alberta Hospital. Other participants were recruited from: field clinics visited by the University of Alberta Hospital Rheumatology specialists (Grande

Prairie and Red Deer); posters at the offices of the three other rheumatology specialists of Edmonton; arthritis patient education classes held at the University of Alberta Hospital; patient support groups in Wetaskiwin, Red Deer, Calgary, Yellowknife and Rimbey; announcements posted in the Edmonton Arthritis Association newsletter; direct solicitation of members of the Edmonton Arthritis Association; advertisements placed in the Edmonton Journal, Edmonton Sun, Calgary Herald, and the University of Alberta student and faculty newspapers; posters in Edmonton family practice and Edmonton Board of Health clinics; and posters placed in a variety of other community locations in the Northern Alberta region (e.g., food stores, senior citizens' homes, and community centres). Participants volunteered by phoning the telephone numbers indicated indicated on the posters and advertisements, or they were recruited directly at home or at medical clinics by the researcher and his associates.

Participation in the study essentially involved the independent completion of the 205 item paper and pencil questionnaire, estimated to take between forty-five minutes and one hour and fifteen minutes to finish. Most volunteers participated by phoning in their mailing address and questionnaires and envelopes were mailed to them. They then mailed the questionnaires to the researcher using self-addressed, postage-paid envelopes provided for this purpose. A description of the purpose for the study and instructions for completing the questionnaire were provided on the first page of the questionnaire (see Appendix A). These included the phone number of the researcher who could be contacted in the event of difficulty in completing the questionnaire. In two cases, volunteers were assisted in participating in the study by completing the questionnaire in a telephone interview. Returned questionnaires were reviewed for unanswered questions and decisions were made as to the appropriateness of including each questionnaire for analysis (see exclusionary criteria in **Sample** section).

Analysis

This study endeavoured to account for a complex set of relationships identifed from a sample of RA patients which would be expected to have a wide variability in terms of differences in coping and quality of life. To understand this complexity it is essential to examine the data obtained in a multivariate manner (Watson & Kendall, 1983). Three multivariate statistical procedures were used to analyze relationships in the obtained data following the computation of correlation matrices of all variables using Pearson product-moment correlational analyses. These statistical procedures were multiple regression analyses, factor analyses, and discriminant function analyses.

Multiple regression is a method of studying the separate and collective contributions of one or more independent variables to the variation of a dependent variable (Wampold & Freund, 1987). From this examination, it is possible to identify a linear combination of the variables which most highly correlates with a dependent variable, thereby permitting an assessment of the significance of each independent variable in terms of its "predictive" capacity to account for the variance in the dependent variable (Kerlinger, 1973). In this research, forward multiple regression, similar to stepwise multiple regression, was the selected procedure because it uses an algorithm to hierarchically select significant predictor variables according to the strength of their relationships with the criterion measure (Wampold & Freund, 1987). For the purposes of this study, the primary predictor variables were the measures of coping, while the criterion variables were the two quality of life measures, physical comfort and functional ability.

Factor analysis is an analytic technique that permits the reduction of a number of interrelated variables to a smaller number of conceptually meaningful constructs (Tinsely & Tinsley, 1987). It is also a method of extracting common factor variances from a set of measures (Kerlinger, 1973). The present study has attempted to bring parsimony to a field of research which has grown in complexity and breadth. Factor analysis is a statistical procedure which could be helpful in accounting for both the common variance, and unique variance, attributable to the factors derived from the coping measures used to predict physical comfort and functional ability.

Factor analysis is a broad category of approaches to conceptualizing groupings of variables and an even broader collection of mathematical procedures for determining which variables belong to which groups (Nunnally, 1978). Principal components analysis was the exploratory extraction method chosen when attempts to use the original method of choice (principal axis) were unsuccessful due to the quality of the data obtained. Neither method offers results which usually differ significantly (Tinsley & Tinsley, 1987). Factors derived from the analysis can be conceptualized in terms of their ability to explain the variance of a particular variable or criterion measure (Kass & Tinsley, 1979). These factors should be viewed as hypotheses when one wishes to generalize about their explanatory capabilities (Nunnally, 1978). Factor analysis was performed from a Pearson correlation matrix of the coping predictors. The extraction method used was the principal components procedure (SPSSX, 1989), follwed by a varimax rotation of the resultant factors in order to arrive at an orthogonal factor solution.

Another of the aims of this study was to classify patients, according to their scores on different measures, into a number of clinically significant groups. Discriminant analysis was selected for this purpose because it weights and linearly combines scores on predictor or discriminator variables in such a manner as to force groups to be as mathematically distinct as possible (Brown & Tinsley, 1983). Discriminant function analysis is analogous to multiple regression in that both involve prediction from a set of continuous predictor variables to a criterion. However, multiple regression predicts to a continuous criterion while discriminant analysis predicts to a categorical criterion or, in other words, group membership (Betz, 1987). Furthermore, though both forms of statistical analysis produce linear equations which consist of beta weights, indicating the relative weight of each variable in predicting the criterion, only in discriminant function analysis do these weights maximally discriminate the criterion groups. These beta weights could best be viewed as discriminator variables predicting group membership (Betz, 1987). It was a secondary aim of this study to develop profiles of RA patients based on their scores on the different measures. Such profiles, or discriminators of group membership, included: a) patients who were physically comfortable vs. those who were physical discomforted, b) patients who were functionally able vs. those who were functionally disable, c) patients using active vs. passive coping styles and d) patients who were treatment compliant vs. treatment resistant. A stepwise discriminant analysis procedure was used (SPSSX, 1989). In the last case (d), this procedure was used only with those predictors found to be significant in the correlational analysis.

Statistical Procedures

The following sequence of analyses was used to analyze the data:

1. Reliability. Cronbach's alpha, using the Statistical Package for the Social Sciences (SPSSX 1989) RELIABILITY program was calculated to determine the internal consistency of the instruments used with the total sample. According to Cronbach (1951), the internal consistency of an instrument is the "...mean of all the split-half coefficients resulting from different splittings of a test. Alpha is therefore an estimate of the correlation between two random samples of items from a universe of items like those in the test." (p.297).

2. The SPSSX ONEWAY and T-TEST programs were used to assess variance in the levels of the single item measures as they related to the quality of life measures. The significance level was set at $p < .05$.

3. Pearson Correlations. The SPSSX PEARSON CORR Program was used to calculate the Pearson product-moment correlations among the different coping, quality of life, and demographic variables. The significance level for each coefficicent was based on a two-tailed test ($p < .05$). Pearson correlations were calculated to test hypothesis 1.

4. Stepwise Multiple Regression. The SPSSX REGRESSION program was used to compute linear equations as tests of hypotheses 3 and 4, and as a preliminary test of hypothesis 2. Variables were entered for analysis using a Forward Selection procedure. Using factors extracted from the factor analysis of the coping measures, as they related to the quality measures, further multiple regression analyses were computed. The signficance level for these analyses was set $p < .05$.

5. Factor Analysis. The SPSSX FACTOR program was selected for factoring the coping measures as they related to the 2 quality of life variables using the principal components method of extraction. The decision rules utilized to identify and determine the number of factors were Kaiser's Criterion and Cattell's Scree Test. A varimax rotation procedure was used to produce an orthogonal factor solution. Predictors for each resulting factor were retained if they showed a correlation, or loading, of 0.40 or greater. Factor analysis was used to test hypothesis 2.

6. Discriminant Function Analysis. The SPSSX DISCRIMINANT program was used to carry out several linear discriminant function analyses. A stepwise selection procedure was used to identify significant predictors. Wilks Lambda and the Chi Square were used as the tests of significance for the resuting discriminant functions for each group for each hypothesis. Because of the size of sample used, the recommended cross-validation procedure (Betz, 1987) was not used. The hypotheses tested using this form of analysis included hypothesis 4, hypothesis 5, hypothesis 6, and hypothesis 7.

Chapter IV

Results

The purpose of this study was to identify and evaluate relationships between measures of three dimensions of coping, and measures of quality of life for RA patients. Though few measures representative of each of these coping dimensions and quality of life domains were selected, analyses of the relationships between these measures were complex. This chapter, following brief statistical descriptions of the study's sample and measures, will report the findings for each of the hypotheses stated in Chapter 3.

Sample Characteristics

Demographic and clinical characteristics of the sample are reported in summary form in Table 1. Two hundred and ninety-six volunteers participated in the study by returning questionnaires to the researcher. The participation rate by males (26%) and females (74%) approximates the prevalence statistics cited in Chapter 2. This response rate was determined from mail-out information gathered when participants volunteered for the study (i.e., the questionnaires were mailed out to participants). After exclusions based on criteria specified in chapter 3, and those questionaires returned too late for analysis, two hundred and forty-four participants' responses were included for analysis.

The subjects included for analysis represented a clinical population which generally had long-term experience with the symptoms of RA (e.g., 66% of the sample had RA for more than 5 years). Almost half of the subjects reported having other illnesses, the bulk of which were chronic, but mild or moderate in terms of severity.

Table 1

Demographic and Clinical Characteristics of the Sample

Respondents		296
Exclusions		
	Late Responses	23
	No RA Diagnosis	9
	Chronic Severe Illness	8
	Recent Surgery	12
	Total	52
Inclusions		244
Duration of RA	10 years +	49%
	5 to 10 years	17%
	2 to 5 years	17%
	6 months to 2 years	14%
	less than 6 months	2%
% Other Illness/ No Other Illness		48.4/51.6
Age: Mean and Standard Deviation		53.3 +/- 14.11years
Age: Median & Range		57 / 6 to 79 years
% Married / Nonmarried		58/42
Education	less than Gr.12	25%
	Gr. 12	35.2%
	Trades/College	20.1%
	BA/BSc	11.5%
	Ma/MSc	6.6%
Income: (Household)	less than $10,000	16.4%
	$10 to $20,000	18.4%
	$20 to $30,000	20.1%
	$30 to $45,000	17.2%
	more than $45,000	20.5%
% Compliant with Medications/ Noncompliant		71/29
% Compliant with Prescribed Exercise/ Noncompliant		20.5/79.5

Demographically, the sample ranged in age from 6 years to 79 and the mean age was approximately 53 years. In terms of education, 38.2% of the subjects reported some form of post-secondary education, while 25% reported having less than Grade 12 education. Income level was relatively evenly dispersed across the sample. Graphic representations of the sample by these characteristics are found in Figures 1 to 6 in Appendix C. The subjects, in all but a few cases, were from Alberta and the majority were from either of Alberta's major urban centres, Edmonton or Calgary. The bulk of participants had responded to advertisements in the Edmonton Journal and Calgary Herald, though a large number were members of the Edmonton Arthritis Assocation who volunteered when they were telephoned regarding participation in the study.

The Measurement Instruments

All data obtained for this study came from self-report instruments included in a general questionnaire referred to as the "Responses to Rheumatoid Arthritis Questionnaire" (see Appendix A). With the exception of some single item questions regarding demographic, health status and health behaviour information, the majority of the items included in the "Responses to Rheumatoid Arthritis Questionnaire" were from standardized scales outlined in Chapter 3. Though the scales had demonstrated adequate psychometric properties in earlier studies, descriptive statistics (including possible and actual range of reponses) and Cronbach's alpha coefficient of internal consistency were calculated for each instrument in the "Responses to Rheumatoid Arthritis Questionnaire" using the SPSSX (1989) program, "Reliability". Table 2, "Descriptive Statistics and Cronbach's Alpha of the Instruments for the Sample", found in Appendix B, reports these statistics.

The internal consistency statistics generally conformed with those reported in Chapter 3 , with some important exceptions. The Health-Related Hardiness Scale (HRH) had been reported as demonstrating an alpha coefficient of 0.86 for the full scale, while for this sample it demonstrated an alpha coefficient of 0.72. The Arthritis Impact Measurement Scales Physical Function Factor (AIMSPF) had no earlier reported alpha coefficient. For this sample an alpha coefficient of 0.77 was obtained.

Prior to an analysis of the relationships between the coping and quality of life measures, it seems appropriate to mention that, with few exceptions, the quality of life measures were uncorrelated with demographic and health behaviour measures. Tables 23 through 46 in Appendix B show the relationships between levels on these single item measures and scores on the quality of life measures. The exceptions were that weak negative relationships were found between two measures: education and reports of voluntarily exercising - with physical comfort. Functional ability was weakly and negatively related to education and income. For more specific details regarding these relationships, the reader is directed to Table 3a in Appendix B.

Hypothesis 1

Hypothesis 1 stated that significant relationships would be found between measures of coping beliefs, coping practices, and coping resources, and measures of quality of life. This hypothesis was supported with some qualifications.

Table 3 reports the Pearson correlations found between the measures of coping and quality of life. In examining the relationships between the coping measures and the first of the quality of life measures, Physical Comfort, as measured by the Activities of Daily Living Pain Scale (ADLPAIN), a number of relationships appear significant. The highest order correlations were with the two measures of coping belief, the ASE (Arthritis Self-Efficacy Scales) and the Arthritis Helplessness Index (AHI), which, respectively, were negative and strong (-.61, p<.001), and postive and modest (.49, p<.001) in their predictive abilities. The coping practice measures, the Vanderbilt Pain Management Inventory Active (VPMI-A) and Passive (VPMI-P) Coping Style subscales, show modest correlations with ADLPAIN, in the directions anticipated {i.e., that active coping would correlate negatively with physical comfort scores (-.21, p<.01) while passive coping would positively correlate with physical comfort(.38, p<.001)}. The other coping practice measure, the TAS (Toronto Alexithymia Scale), was not a significant predictor of physical comfort. The coping resource measures, as a coping dimension, demonstrated the weakest correlations with physical comfort. A weak but positive correlation was found between ADLPAIN and the West- Haven Yale Multidimensional Pain Inventory subscale measuring punitive support received from a significant other (MPI-PR) (.24, p<.001). Smaller, yet still significant negative correlations with ADLPAIN were found with the personality or intrapsychic resource measure, health-related hardiness (HRH, -.13, p<.05), and the West Haven-Yale Multidimensional Pain Inventory's Distracting Responses subscale (MPI-DR) (-.12, p<.05). Other measures of social support were nonsignifcant. The results demonstrate that, when examined in terms of coping dimensions conceptualized for this study, physical comfort is predicted in descending order of significance by measures of coping beliefs, coping practices and coping resources respectively.

Table 3

PEARSON CORRELATIONS AMONG DEPENDENT MEASURES AND COPING PREDICTOR VARIABLES

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1 AHI	1.00											
2 ASE	-.60***	1.00										
3 HRH	.11	.08	1.00									
4 MPI-S	-.01	.00	.02	1.00								
5 MPI-PR	.25***	-.21**	.02	.63***	1.00							
6 MPI-SR	-.02	-.08	-.08	.63***	-.33***	1.00						
7 MPI-DR	-.13*	.03	-.08	.45***	-.31***	.63***	1.00					
8 TAS	.18**	-.17**	.12*	.00	.17**	.05	.05	1.00				
9 VPMI-A	-.37***	.48***	-.06	.07	-.04	.05	.09	-.15*	1.00			
10 VPMI-P	.52***	-.42***	.02	.07	.26***	.18**	-.01	.24***	.28***	1.00		
11 ADLPN	.49***	-.61***	-.13*	-.08	.24***	.00	-.12*	.05	-.21**	.38***	1.00	
12 AIMSPF	.46***	-.70***	-.05	.07	.19**	.16**	.04	.10	-.34***	.29***	.54***	1.00

(N=234) $^{***}p<.001$ $^{**}p<.01$ $^{*}p<.05$

AHI= Arthritis Helplessness Index/ **ASE**=Arthritis Self-Efficacy Scales/ **HRH** = Health-Related Hardiness Scale **MPI-S**= West Haven-Yale Multidimensional Pain Inventory - Support Subscale/ **MPI-PR** / West Haven-Yale Multidimensional Pain Inventory - Punishing Response Subscale/ **MPI-SR** West Haven-Yale Multidimensional Pain Inventory - Solicitous Responses Subscale/ **MPI-DR** West Haven-Yale Multidimensional Pain Inventory - Distracting Responses Subscale / **TAS**= Toronto Alexithymia Scale / **VPMI-A**=Vanderbilt Pain Management Inventory-Active Coping Scale/**VPMI-P** Vanderbilt Pain Management Inventory-Passive Coping Scale/ **ADLPN**= Activities of Daily Living Pain Scale/ **AIMSPF**= Arthritis Impact Measurement Scales-Physical Function Factor

When the other quality of life measure, functional ability as measured by the AIMSPF, is examined for its relationships with the coping measures, a similar configuration of results is demonstrated. The AIMSPF showed the most predictive relationships with coping beliefs. A strong negative relationship was found with the ASE (self-efficacy) (-.70, p<.001) and a modest and positive relationship was shown with the AHI (helplessness)(.46, p<.001). Coping practices, to a lesser extent, were related to functional ability, with the VPMIP (the Passive Coping Subscale of theVanderbilt Pain Management Inventory) (-.34, p<.001) and VPMIA (Active Coping subscale of the Vanderbilt Pain Management Inventory) (.29, p<.001) being correlated in the expected directions. The other measure of coping practice, the TAS (alexithymia), was nonsignifcant. When coping resources were examined, some differences from those noted in physical comfort were evident. Punitive social responses (MPIPR - West Haven-Yale Multidimensional Pain Inventory) were again weakly and positively related to functional ability (.19, p<.01), but nonsignificant correlations were found for the HRH (Health-Related Hardiness) and the Distracting Support Responses subscale (MPIDR - West Haven-Yale Multidimensional Pain Inventory). Another form of social support, solicitous responses (MPISR - West Haven-Yale Multidimensional Pain Inventory), was found to be weakly correlated with functional ability (.16, p<.01). No other forms of social support were found to be significant predictors of functional ability. Again, measures of coping beliefs, coping practices, and coping resources were found to be significant in predicting a feature of quality of life in RA patients, functional ability. Similarly, these measures of coping were most predictive for measures of belief, followed by measures of coping practices, and lastly, in this instance, measures of social coping resources only.

Hypothesis 1 is supported with some qualifications, suggesting that measures of coping beliefs, coping practices, and coping resources are related to the two measures of quality of life, physical comfort and functional ability. It would appear that scores on the coping belief measures are most predictive of scores on the quality of life measures, with scores on the coping practice measures and coping resource measures contributing, respectively, smaller associations with scores on the quality of life measures. Certain measures of coping practice and coping resources selected for this study appear marginally important in terms of their abilities to predict scores on the quality of life measures. For example, health-related hardiness (HRH) and distracting responses from a significant other (MPIDR - West Haven-Yale Multidimensional Pain Inventory) subscale appear to have a slight relationship to physical comfort (-.13, & -.12, $p < .05$ respectively), but no significant relationship to functional ability. Similarly, solicitous responses from a significant other (MPISR - West Haven-Yale Multidimensional Pain Inventory) predicts functional ability but not physical comfort. The general social support measure (MPIS - West Haven-Yale Multidimensional Pain Inventory) was nonpredictive for either form of quality of life. In general, however, measures of coping beliefs, coping practices, and coping resources were found to be significantly related to measures of quality of life in RA patients.

Hypothesis 2

The second of this study's hypotheses predicted that factor analysis of the coping measures would permit a more parsimonious account of factors related to the two quality of life measures in line with the coping dimensions hypothesized. This hypothesis was not supported.

In evaluating the previous hypothesis, it was apparent that patterns of collinearity were evident in this study's coping measures, and primarily those associated with the coping dimensions conceptualized for this study: beliefs, practices and resources. Bartlett's Test of Sphericity was used to assess the significance of the correlations in the matrix used for factor analysis. The significance of this test ($p < .000$) indicated that the data was suitable for factor analysis. Principal components, a method of factor analysis, extracted four significant factors. To maximize the differences between the factors, varimax rotation was used. In examining Table 4, one finds a four factor solution which explains 70.6% of the variance from scores on the original measures.

The four resulting factors represent different patterns in the measures than those dimensions hypothesized with one exception. The first factor, accounting for the greatest amount of variance among the coping measures, was comprised of the four support subscales of the West Haven-Yale Multidimensional Pain Inventory. While each of these subscales was hypothesized to measure different forms of support from a significant other, it would appear that, when evaluated together with the other measures of coping, they measure a similar coping dimension. The negative loading of the MPIPR (West Haven-Yale Multidimensional Pain Inventory -Punishing Responses) subscale on this factor is consistent with the expectations of this measure's authors, but otherwise, in this context, the remaining subscales do not clearly differentiate from each other as coping measures. This factor could be considered as: "forms of support received from a significant other".

Factor 2 consists of measures of both coping beliefs and coping practices. While the belief scales tended to measure a perception that the subject could, or could not, manage a facet of life considered to be influenced by RA, the coping practice scales measured endorsements of forms of coping used to influence

Table 4

Factor Analysis of Coping Predictor Measures

Measures	Factor 1	Factor 2	Factor 3	Factor 4	Communality
MPISR	.88				.79
MPIS	.82				.70
MPIDR	.79				.71
MPIPR	-.58		.53		.67
ASE		-.83			.72
AHI		.79			.68
VPMIA		-.76			.67
VPMIP		.60	.49		.62
TAS			.76		.65
HRH				.91	.85
Eigenvalue	2.64	2.32	1.09	1.01	
Percent of Variance	26.4%	23.2%	10.9%	10.1%	
Cumulative Percent	26.4%	49.6%	60.5%	70.6%	

(N=232) Bartlett Test of Sphericity =632.76 Significance= 0.000

(Extraction=Principal Components/ Rotation= Varimax Converged in 6 Iterations)

MPISR=(West Haven-Yale) Multidimensional Pain Inventory - Solicitous Responses Subscale/ MPIS=Multidimensional Pain Inventory - Support Subscale/ MPIDR=Multidimensional Pain Inventory - Distracting Responses Subscale/ MPIPR= Multidimensional Pain Inventory - Punishing Responses Subscale/ ASE=Arthritis Self- Efficacy Scales/ AHI=Arthritis Helplessness Index - Helplessness Factor/ VPMIA= Vanderbilt Pain Management Inventory - Active Coping Subscale/ VPMIP=Vanderbilt Pain Management Inventory - Passive Coping Subscale/ TAS= Toronto Alexithymia Scale/ HRH= Health-Related Hardiness Scale

one's experience of RA symptoms. This suggests that both types of measures assess a common coping dimension, reflecting a similarity in how subjects believed and perceived themselves managing the symptoms of RA. "Coping", in this sense, could be considered to be perceptions of behaviours used to manage the symptoms of the disease and to manage normal activities of life. This dimension could, then, best be summarized as: "perceptions of coping".

Noticeable by its absence from Factor 2 is the TAS (Toronto Alexithymia Scale) which had been hypothesized as a form of coping practice. Instead, it appears as the largest loading scale on the third factor, tapping a dimension of emotional coping that the TAS had been hypothesized to measure. The loading of MPIPR (punitive responses from one's most significant other - West Haven-Yale Multidimensional Pain Inventory) on this factor is consistent with findings from the literature on social support which suggests that it is the emotional support (positive or negative) from others which is most beneficial (e.g., Thoits, 1986). The loading of passive coping (VPMIP - Vanderbilt Pain Management Inventory) on this factor can best be explained by the number of emotional coping items asked on this subscale. Studies have clearly demonstrated differences in quality of life when one practices emotional forms of coping versus more active forms of coping (e.g., Felton & Revenson, Turk & Flor, 1988). This factor could be best summarized as: "emotional coping".

Finally, a fourth factor emerged that was accounted for entirely by the hardiness measure (HRH). As a measure of personality or, as conceptualized here, intrapsychic resources related to general health issues, it is logical for this measure to demonstrate a different relationship with the other variables and factors. Though it had been assumed that hardiness could be a reflection of one's social resources, thus justifying the inclusion of this variable with other forms of resources, analysis did not support this assumption. The resulting factor shall therefore be termed " hardiness".

While factor analysis has enabled the coping measures to be reduced to a more parsimonious account of the coping factors related to quality of life, the results of this analysis do not support the predicted three factor solution hypothesized in the dimensions of beliefs, practices and resources. Instead, the resulting four factors could be more adequately explained as: 1) forms of support from a significant other; 2) perceptions of coping ; 3) emotional coping; and 4) hardiness.

Hypothesis 3

Hypothesis 3 extended the position taken in hypothesis 1, that significant relationships would be found between the three coping dimensions and their measures, to assume that linear combinations of the coping measures would predict levels of physical comfort and functional ability. This hypothesis was not supported.

To evaluate this hypothesis, forward multiple regression was used as an exploratory means to identify the linear combination of variables which were maximally predictive of both quality of life variables. Essentially, forward multiple regression is an exploratory method which enables the researcher to determine the linear combination of the predictors which is maximally correlated with the criterion measure. The predictor measure demonstrating the highest zero-order correlation with the criterion measure is entered first into the analysis. This is followed in successive order by those significant measures which add the largest increments to the equation's overall correlation coefficient (Adjusted R^2), after having taken into account the variance contributed by measure(s) already in the equation (Pedhazur, 1982). The resulting regression equation consists of a constant value for the criterion measure added to "weightings" derived for the predictor measures selected sequentially according to their declining relative contributions to explaining the variance in the criterion measure. These weightings, referred to as beta weights, indicate the degree to which a change in levels of the predictors is related to a change in levels of the criterion measure. The predictive ability of the resulting equation is indicated by the adjusted R^2 shown for the final predictor measure indicated as being significant in the equation. The significance of the variance explained by each successive partial regression coefficient, in relation to the remaining unexplained variance, is indicated by the F value reported for that partial regression coefficient.

Pedhazur (1982) warned that a shortcoming with the forward selection procedure is that once predictors have been entered into the regression equation, they are "locked in", unlike the stepwise procedure which permits an ongoing re-analysis of each predictor's correlation as new predictors are added to the regression equation. For this reason, he cautioned researchers to note the significance of the regression coefficients at the termination of the analysis in the event that some of the early entry variables have not changed in their significance or order in the regression equation with subsequent steps in the analysis. This was not a problem in the use of forward selection multiple regression analyses used to evaluate hypothesis 3.

Table 5 reports the results of the multiple regression analysis for physical comfort (ADLPAIN) when all coping predictors were entered for analysis. Exploratory regression analysis indicated that the resulting regression equation, using the coping factors, was less able to predict physical comfort than a regression equation derived the original coping predictors. For this reason, no results using the coping factors is reported.

The strong correlation of self-efficacy (ASE) with physical comfort, in comparison with the other measures included in the resultant equation, highlights an important feature of forward multiple regression. Comparing the original Pearson correlations between the coping and quality of life measures reported in Table 3 and the results of this analysis, one can notice the role that collinearity plays in regression analysis. Table 3 showed that, while ASE (self-efficacy) was the strongest predictor of pain (-0.61), the next most significant predictor, AHI or Arthritis Helplessness, (0.49) also was a strong predictor. An examination of Table 5 reveals that AHI, while being the second highest predictor of physical comfort, contributes only an additional 2% of predictive power to the regression equation. This is further support for the findings reported for hypothesis 2 which indicated that ASE (self-efficacy- Arthritis Self-Efficacy Scales) and AHI (helplessness- Arthritis Helplessness Index - Helplessness Factor) loaded together on the same factor and thus share a large amount of common variance. When one examines the contributions of the remaining significant variables to explaining the variance in physical comfort, the HRH (Health-Related Hardiness) and MPI-PR (Punitive Responses from a significant other - West Haven-Yale Multidimensional Pain Inventory) contribute a further 2% and 1% respectively to the overall predictive capacity of the resulting regression equation. Noticeable by their absence in the regression equation are the coping practice measures, VPMIA (active coping style - Vanderbilt Pain Management Inventory) and VPMIP (passive coping style - Vanderbilt Pain Management Inventory), adding further support to the results of the factor analysis which indicated that they tapped a dimension which included the higher loading belief measures. Overall, the resulting regression equation of coping measures predicted 41% of the variance in physical comfort.

Table 5

Forward Multiple Regression: Physical Comfort by Coping Measures

Criterion	Predictor	Mult. R	Adj. R2	F	Beta	p<
ADLPAIN	1 ASE	.61	.36	132.96	-.46	.000
	2 AHI	.62	.38	72.41	.19	.01
(N=230)	3 HRH	.64	.40	51.40	-.13	.05
	4 MPIPR	.65	.41	40.50	.12	.05

Standard Error= 5.44 Constant= 32.77

ASE= Arthritis Self-Efficacy Scale/ AHI= Arthritis Helplessness Index/ HRH= Health-Related Hardiness/ MPIDR= West Haven-Yale Multidimensional Pain Inventory - Punishing Responses Subscale

When demographic and health behaviour measures were added to the coping measures regression equation, the results were essentially the same as for the coping measures alone (see Table 6 in Appendix B). A separate regression analysis was computed for the demographic and health behaviour measures. This analysis (see Table 7 in Appendix B) revealed that the degree to which participants endorsed the voluntary practice of regular exercise, and the degree to which participants endorsed their adaptation to RA by modifying their activities, were significant predictors accounting for 11% in the variance in physical comfort.

Functional ability, as measured by the AIMSPF, was analyzed for its relationship to the coping measures and only one of the measures was selecteded in the resulting equation. As was the case for physical comfort, a decision was made to not report the results of the regression analysis performed using the coping factors. Table 8 shows

Table 8

Forward Multiple Regression: Functional Ability by Coping Measures

Criterion	Predictor	Mult. R	Adj. R2	F	Beta	p<
AIMSPF (N=230)	1 ASE	.71	.50	232.34	-.71	.000

Standard Error=3.29 Constant= 46.05

AIMSPF= Arthritis Impact Measurement Scales Physical Function Factor/ ASE= Arthritis Self Efficacy Scales

that ASE (Arthritis Self-Efficacy Scales) was strong, predicting 50% of the variance in functional ability. When demographic and health behaviour measures were added to the coping measures in the analysis, more predictors were included in the final equation, but little additional predictive power was added. Table 9 in Appendix B shows that two measures of support from a significant other, the MPIPR (West Haven-Yale Multidimensional Pain Inventory) and general support (MPIS - West Haven-Yale Multidimensional Pain Inventory) contributed 3% and 2% respectively to the predictive power of the regression equation. The emotional coping measure, TAS (Toronto Alexithymia Scale), added a further 2% of predictive power yielding an overall regression equation which predicted 54% of the variance in functional ability - an improvement of only 4% over the predictive ability of the single ASE (Arthritis Self-Efficacy Scale) measure. When regression analysis of the relationships between the demographic and health behaviour measures (see Table 10 in Appendix B), alone, were computed, the same two health behaviour measures selected from the similar analysis for physical comfort were obtained. These measures were self-reported degrees of voluntary exercising and degrees of adpatation to RA. Together, they predicted 10% of the variance in functional ability scores.

The results of the regression analyses performed do not support hypothesis 3. Instead of the expected linear combinations of measures consisting of coping beliefs, coping practices and coping resources in predicting the quality of life measures, it appears that measures of coping belief, in particular the ASE (Arthritis Self-Efficacy Scale), are most predictive of the two quality of life measures. In some instances, other coping measures, or factors derived from those measures, marginally added to the variance predicted by the self-efficacy measure but not in the manner hypothesized.

Intepreting Hypothesis 4 to Hypothesis 7

The remaining hypotheses postulated that, on the bases of scores on the predictor measures, one could classify subjects into statistically different groups created from prespecified classification criteria. As an example, hypothesis 4 stated that the scores on coping measures predicting physical comfort would be different from those predicting physical discomfort. The arbitrary score used to make the discriminations performed in this study was the mean score on the relevant scale. This was done because numbers were insufficient to use more extreme scores such as a cut-off point one standard deviation above or below the mean scores. To test the differences specified in hypotheses 4 through 7, discriminant analyses were performed.

Discriminant analysis enables the researcher to maximize differences between groups according to linear combinations of measures, or functions, derived from score profiles on the original predictor measures. Its methods for maximizing these group differences are analogous to aspects of multiple regression and factor analysis. Discriminant analysis, like multiple regression, produces a linear combination of weighted functions, new variables which are maximally capable of predicting a criterion score, in this case, the discriminant score. Its similarity to factor analysis is that the functions derived to predict group membership are similar to factors. They are typically combinations of the original measures and, like factors, the original measures "load" on their respective functions as discriminant function coefficients. Only those measures with the highest loadings are retained in the function. Discriminant functions, like factors, are new variables created from orthogonal linear combinations of the original measures (Brown & Tinsley, 1983). In the case of the analyses performed here, one function was used to maximize the difference between two arbitrarily classified groups.

From discriminant analysis of two groups one obtains a single function capable of predicting a percentage of the variance in the criterion measure used for classification. This percentage is like that yielded by a predictor's correlation coefficient with a criterion, and is reported as an eigenvalue for that function. A canonical correlation, indicating the proportion of variance accounted for by a function according to group differences, is also computed when one performs discriminant analysis. Wilks' lambda and Chi-Squared statistics are also provided, permitting the researcher to evaluate the significance of the discriminant functio

After the discriminant function has been calculated, discriminant scores can be determined for the group according to its mean scores, or for each individual according to that individual's scores on the measures included in the function. The two groups created by the discriminant function will have means, or centroids, which represent the average profile for that group and provide a point about which individuals in the groups, according to their discriminant scores, vary in distance and direction (Nunnally, 1978). Evaluating the discriminant scores of individuals in each group, given the way they cluster around the group centroids, enables the researcher to assess the accuracy with which the function permits accurate classification. This classification accuracy is also referred occasionally as a "hit rate" (Betz, 1987).

Hypothesis 4

Hypothesis 4 predicted that there would be significant differences between measures predicting physical comfort when compared to those predicting physical discomfort. Evaluation of this hypothesis was based on an arbitrary division of subjects into "physical comfort" and "physical discomfort" groups according to their scores below or above the mean on the ADLPAIN measure.

Table 11 reports the canonical discriminant function, standardized canonical discriminant function coefficients, the group centroids for the physically comfortable and physically discomforted groups, and the group classification results. In examining the canonical discriminant function, it is evident that the resulting eigenvalue for the function is 0.35. To obtain the relative percentage that this eigenvalue contributes to explaining the variance in the discriminator variables, it is necessary to divide 0.35 by the number of significant discriminator variables included in the function which is, in this case, four. Therefore, the discriminant function only predicts approximately 8.75% of the variance in these variables. The canonical correlation of 0.51 shows the proportion of variance in the function related to differences between the two classification groups. Put differently, the square of the canonical correlation, 0.26 is a correlation coefficient predicting 26% of the variance in the two groups, "physical comfort" and "physical discomfort". When the significance of this function was tested, the resultant chi squared was significant at $p<0.000$.

Table 11

Canonical Discriminant Function High/Low Physical Comfort by Coping Predictors

Function	Eigenvalue	Percent of Variance	Canonical Correlation	Wilks' Lambda	Chi Square	Df	Probability
1	0.35	100.00	0.51	0.74	68.22	4	0.000

Standardized Canonical Discriminant Function Coefficients High versus Low ADLPAIN Scorers by Coping Predictors

Variables	Function
ASE	0.67
VPMIP	-0.29
AHI	-0.25
HRH	0.25

Group Centroids (Means) High versus Low ADLPAIN Scorers by Coping Predictors

Group	
Low ADLPain	0.59
High ADLPain	-0.59

Classification Results of the Discriminant Analysis: High versus Low ADLPAIN Scorers by Coping Predictors

Actual	Predicted Group Membership		
Group	Group 1	Group 2	Total
Low ADLPAIN	86 74.1%	30 25.9%	116
High ADLPAIN	34 29.6%	81 70.4%	115

Percent of "Grouped " Cases Correctly Classified: 72.29%

Four measures were selected from the stepwise entry procedure. These measures are shown as the standardized discriminant function coefficients and are, in order of selection, as follows: ASE(Arthritis Self-Efficacy Scales), VPMIP (Vanderbilt Pain Management Inventory - Passive Coping Subscale) , AHI (Arthritis Helplessness Index - Helplessness Factor), and HRH (Health-Related Hardiness Scale). These predictors could be considered as equivalent to partial correlations in regression equations, with the function being the predicted criterion. Thus, as with multiple regression, if the predictors are intercorrelated, one may receive most of the weight, while others correlated with this predictor would receive decreased weightings (Betz, 1987). These weightings are reported here as standardized discriminant function coefficients. It would again appear that ASE (Arthritis Self-Efficacy Scales) accounts for a substantial proportion of the variance in both the criterion and predictor measures when one examines the discriminant function coefficients. Using the group centroids for classification purposes, the resultant discriminant function classified 72.29% of the cases assigned to the two groups.

Hypothesis 4 is supported because the discriminant analysis indicates that the physically comforted and physically discomforted groups can be significantly differentiated on the basis of scores on certain predictor measures included in the discriminant function. It would thus appear that the higher the levels of ASE (Arthritis Self-Efficacy Scale) and HRH (Health-Related Hardiness), and the lower the levels of VPMIP (Vanderbilt Pain Management Inventory - Passive Coping Subscale) and AHI (Arthritis Helplessness Index - Helplessness Factor), the greater the likelihood that RA patients would fall into a class of physically "comforted" patients versus those physically "discomforted" patients who would score in the opposite direction on these measures. In interpreting this result, the following considerations are important:

a) The terms "comforted" and "discomforted" have been arbitrarily created as indicating scores above and below the mean for ADLPAIN. As such, these terms must be viewed as range concepts which more closely are associated with the group means for these two groups.

b) The actual degree of physical comfort has been derived from subjective assessments of pain. It is therefore difficult to examine these assessments in any inter-individual or objective manner.

c) The actual amount of variance in physical comfort predicted by the discriminator variables is approximately 26% so caution must be used in relying on the predictive ability of these variables.

d) A further note of caution is warranted. The "hit rates" for classifying the subjects studied according to these two arbitrarily created groups is 72.3%, indicating that there is a 27.7% possibility for error using this classification procedure.

e) Finally, the discriminant function is the product of exploratory analysis. Most researchers (e.g., Betz, 1987; Stevens, 1986) suggest that a discriminant function requires cross-validation on a different sample. In this case, cross-validation was not possible because of the size of the sample and study delimitations. This function, and those following, should therefore be viewed as tentative and exploratory, necessitating cross-validation.

Hypothesis 5

Hypothesis 5 predicted that subjects could be classified into functional and dysfunctional groups on the basis of scores on certain coping measures. This hypothesis was also supported. Closer examination of Table 12 shows that the percentage of variance in functional ability explained by the discriminant function resulting from this analysis is 13.3%, derived from the function's eigenvalue of .68. Five discriminator variables were selected for inclusion in the discriminant function. In this case, as with the multiple regression equation for functional ability by the coping measures, the most significant discriminating variable in the function, by far, was ASE (Arthritis Self-Efficacy Scales) , followed by VPMIA (Vanderbilt Pain Management Inventory - Active Coping Subscale), TAS (Toronto Alexithymia Scale), MPIPR (Punitive responses from a significant other - West Haven - Yale Multidimensional Pain Inventory) and MPIDR (Distracting responses from a significant other - West Haven - Yale Multidimensional Pain Inventory). The discriminant function had a canonical correlation of 0.64 with the two classification groups or, put differently, the function accounted for 41% of the variance in the functional and dysfunctional groups. The difference between the two groups was statistically significant at $p<0.001$. On the basis of the group centroids computed for the functional and dysfunctional groups, 78.02% of all subjects were correctly classified into one or the other group.

Though concerns similar to those expressed in reporting the results for the evaluation of hypothesis 4 apply here (e.g., arbitrary group classifications, a relatively small proportion of variance in the criterion measures is explained by the

Table 12

Canonical Discriminant Function
High/Low Functional Ability by Coping Predictors

Function	Eigenvalue	Percent of Variance	Canonical Correlation	Wilks' Lambda	Chi Square	Df	Probability
1	0.68	100	0.64	0.59	118.04	5	0.000

Standardized Canonical Discriminant Function Coefficients

Variables	Function
ASE	1.07
VPMIA	-0.23
TAS	0.20
MPIPR	-0.24
MPIDR	-0.27

Group Centroids (Means)
High versus Low AIMSPF Scorers by Coping Predictors

Group	
Low AIMSPF	0.68
High AIMSPF	-0.99

Classsification Results of the Discriminant Analysis: High versus Low AIMSPF Scorers by Coping Predictors

Actual Group	Predicted Group Membership Group 1	Group 2	Total
Low AIMSPF	110	27	137
	80.3%	19.7%	
High AIMSPF	24	71	95
	25.3%	74.7%	

Percent of "Grouped" Cases Correctly Classified: 78.02%

discriminant function), differences between the discriminators and their respective weights in the two functions should be noted. It would appear that a different set and weighting of coping variables, predicts differences between functional versus dysfunctional RA patients than those coping variables which differentiated between RA patients who were physically comforted and physically discomforted. In the case of functional ability, it would appear that scores on the ASE (Arthritis Self-Efficacy Scales), VPMIA (Vanderbilt Pain Management Inventory - Active Coping Subscale), TAS (Toronto Alexithymia Scale), MPIPR (Punitive responses from a significant other - West Haven - Yale Multidimensional Pain Inventory) and MPIDR (Distracting responses from a significant other - West Haven - Yale Multidimensional Pain Inventory) measures can assist in classifying patients into functional and dysfunctional groups.

Hypothesis 6

Hypothesis 6 stated that there would be significant differences in the combinations of coping and quality of life variables predicting the use of active coping styles compared to those predicting the use of passive coping styles. The results of the statistical evaluation of this hypothesis indicate that the answer is a qualified yes.

Initial tests of this hypothesis used regression analysis of the quality of life and remaining coping measures with passive coping (Vanderbilt Pain Management Inventory - Passive Coping Subscale) or active coping (Vanderbilt Pain Management Inventory - Active Coping Subscale) as the criterion measures. The first analysis indicated that passive coping was associated predominantly with helplessness beliefs followed by decreasing contributions made by solicitous support from a significant other, punitive support from a significant other, alexithymia and pain (Table 13 in Appendix B). Active coping was associated primarily with beliefs in self-efficacy and marginally with health-related hardiness (Table 14 in Table B). The combinations of coping and quality of life measures predicting either style differ, but this analysis does not provide a means of comparing those who primarily use one style or the other.

To evaluate this hypothesis more fully, enabling a better comparison of those subjects who were high on either coping style measure, discriminant analysis was again used, but changes were made in the variables included as potential discriminators for analysis. In this case, the two subscales of the Vanderbilt Pain Management Inventory had to be removed from the analysis because they became new criterion measures while the quality of life variables, ADLPAIN (physical comfort) and AIMSPF (functional ability) were added. This permitted a way of determining the extent to which the quality of life variables contributed to patients' styles of coping. Because the SPSSX Discriminant program would not permit simultaneous classification of subjects according to scores from two separate criterion measures in the analysis, a decision was made to combine both subscales of the Vanderbilt Pain Management Inventory, the Active and Passive Coping subscales, simultaneously in the analysis. The use of the two subscales was made possible by combining scores above the mean from one measure with scores below the mean on the other measure, and vice versa. In other words, the two groups created were either High Active Coping Styles (subjects with scores above the mean on the Vanderbilt Pain Management Inventory- Active Coping Subscale)/ Low Passive Coping Style (subjects with scores below the mean on Vanderbilt Pain Management Inventory - Passive Subscale) or High Passive/Low Active Coping Style. Brown and Nicassio (1987), authors of this scale, have stated that the VPMIA (Vanderbilt Pain Management Inventory- Active Coping Subscale) and VPMIP (Vanderbilt

Pain Management Inventory - Passive Subscale) subscales are measuring different dimensions of coping as opposed to extremes of a continuum of one coping dimension. Therefore, in interpreting the results of the following discriminant analysis, one must see the results as comparing subjects reporting combined High Active/ Low Passive Coping Styles to those reporting High Passive/Low Active Coping Styles.

Table 15 reports the results of the discriminant analysis. The discriminant function has an eigenvalue of 1.07, accounting for 21.4% of the variance in the discriminator variables. The canonical correlation for the function is 0.72 and therefore predicts $(0.72)^2$ or 52% of the variance in the two groups created by the function. The discriminator variables included in the function were, in descending order of significance, AHI (Arthritis Helplessness Index - Helplessness Factor), MPIDR (Distracting responses from a significant other - West Haven - Yale Multidimensional Pain Inventory), MPISR (Solicitous response from a significant other - West Haven - Yale Multidimensional Pain Inventory), ASE (Arthritis Self-Efficacy Scales), and TAS (Toronto Alexithymia Scales). No quality of life variables were included in the function, suggesting that degree of physical comfort or functional ability was not significant in differentiating coping styles. The function was significant at the $p<0.001$ level and accurately classified 83.47% of the subjects included in the analysis. It should be noted that the number of cases classified were 121, while 113 subjects were left out of the analysis because their scores on both subscales did not qualify them for membership in either of the two prespecified groups.

Support for hypothesis 6 is qualified because statistical procedures would not permit classification into groups identifiable from distinct VPMIA (Vanderbilt Pain Management Inventory- Active Coping Subscale) and VPMIP (Vanderbilt Pain Management Inventory - Passive Subscale) subscale scores. The two

Table 15
Canonical Discriminant Function
"Active" versus "Passive" Coping by Coping/Quality of Life Predictors

Function	Eigenvalue	Percent of Variance	Canonical Correlation	Wilks' Lambda	Chi Square	Df	Probability
1	1.07	100	0.72	0.48	84.60	5	0.000

Standardized Canonical Discriminant Function Coefficients

Variables	Function
ASE	-0.43
TAS	0.40
AHI	0.54
MPIDR	-0.47
MPISR	0.45

Group Centroids (Means)

Group	
Active Coping	-0.94
Passive Coping	1.12

Classification Results of the Discriminant Analysis:

Actual	Predicted Group Membership		
Group	Group 1	Group 2	Total
Active Copers	54 81.8%	12 18.2%	66
Passive Copers	8 14.5%	47 85.5%	55
Ungrouped Cases	67 59.3%	46 40.7%	113

Percent of "Grouped " Cases Correctly Classified: 83.47%

significantly different groups of subjects created by this discriminant analysis are instead best referred to as high active copers/low passive copers and high passive copers/low active copers. Membership in the two groups can best be understood as a function of scores on the AHI (Arthritis Helplessness Index - Helplessness Factor), MPIDR (Distracting responses from a significant other - West Haven - Yale Multidimensional Pain Inventory), MPISR (Solicitous response from a significant other - West Haven - Yale Multidimensional Pain Inventory), ASE (Arthritis Self-Efficacy Scales), and TAS (Toronto Alexithymia Scales) measures.

Hypothesis 7

Hypothesis 7 predicted that there would be differences in the measures that predict treatment compliance from those that predict treatment resistance, or noncompliance. Two single item statements were posed to the subjects in order to evaluate this hypothesis:

a) I follow my prescription(s):

b) I practice the exercises recommended to by my physician or physical therapist:

The possible responses for these items were:

"i) exactly as indicated;
ii) regularly, but not exactly as indicated;
iii) when I feel I need them;
iv) never".

Compliance in both cases was considered to be indicated by response (i), while noncompliance was considered as any of the other responses. This became the basis for classifying the subjects. Because of the differences in the two types of treatment, it appeared as though two hypotheses would be necessary to replace the one indicated. However, the results obtained from the discriminant analyses performed using scores on both items made it possible to report the results using the stated hypothesis.

The proportion of compliers to noncompliers reported for both measures was reported in Table 1, but Figures 6 and 7 in Appendix D further depict the breakdown according to levels of response on these two measures. The first thing one notices in examining either Table 1 or Figures 6 and 7 is that there is a definite disproportion in the number of subjects reporting levels of compliance for both forms of treatment. More interestingly, the skews differ in opposite directions with most subjects indicating compliance with medical treatment, while the majority reported noncompliance with their recommended exercise program. The substantial differences in number of subjects that would fall into each arbitrary classification group meant that some precautions had to be taken in proceeding with the discriminant analyses used to evaluate this hypothesis. Discriminant analysis requires fewer numbers of potential discriminator variables to be included for analysis when the sample size is small or, in this case, smaller than the samples used in other analyses. A precautionary decision was therefore made to remove certain of the coping predictor measures (Vanderbilt Pain Management Inventory- Active Coping Subscale, Vanderbilt Pain Management Inventory - Passive Subscale, Health-Related Hardiness Scale, Arthritis Helplessness Index - Helplessness Factor, Distracting responses from a significant other Subscale - West Haven - Yale Multidimensional Pain Inventory,

Table 16

Canonical Discriminant Function
Compliance versus Noncompliance with Prescribed Treatments by Coping/Quality of Life Predictors

Function	Eigenvalues	Percent of Variance	Canonical Correlation	Wilks' Lambda	Chi Square	Df	Probability
1	0.03	100	0.16	0.98	5.82	20	.055

Standardized Canonical Discriminant Function Coefficients
Compliers versus Noncompliers with Prescribed Treatments by Coping and Quality of Life Predictors

Variables	Function
AIMSPF	0.81
MPIPR	-0.78

Group Centroids (Means)
Compliers versus NonCompliers with Prescribed Treatments

Group	
Compliers	0.10
NonCompliers	-0.25

Classification Results of the Discriminant Analysis: Compliers versus Noncompliers with Prescribed Treatments

Actual	Predicted Group Membership		
Group	Group 1	Group 2	Total
Compliers	105 62.1%	64 37.9%	169
NonCompliers	26 39.4%	40 60.6%	66

Percent of "Grouped " Cases Correctly Classified: 61.70%

Table 17
Canonical Discriminant Function
Compliance versus Noncompliance with Recommended Exercises by Coping/Quality of Life Predictors

Function	Eigenvalue	Variance	Percent of Correlation	Canonical Lambda	Wilks' Square	Df	Chi Probability
1	0.04	100	0.21	0.96	10.23	2	0.007

Standardized Canonical Discriminant Function Coefficients
Compliers versus Noncompliers with Recommended Exercises by Coping and Quality of Life Predictors

Variables	Function
AIMSPF	-0.50
MPIS	0.88

Group Centroids (Means)
Compliers versus NonCompliers with Recommended Exercises

Group	
Compliers	0.41
NonCompliers	-0.11

Classification Results of the Discriminant Analysis: Compliers versus Noncompliers with Recommended Exercises

Actual	Predicted Group Membership		
Group	Group 1	Group 2	Total
Compliers	36 72.0%	14 28.0%	50
NonCompliers	82 43.4%	107 56.6%	189

Percent of "Grouped " Cases Correctly Classified: 59.83%

Solicitous responses from a significant other - West Haven - Yale Multidimensional Pain Inventory) from the discriminant analyses because multiple regression analyses had shown them to be nonsignificant and weak predictors of both measures.

Discriminant analysis was performed for the first measure according to the classification specifications described earlier. As indicated in Table 16, the resultant discriminant function had an eigenvalue of 0.03 and was found to be nonsignificant ($p<0.01$). This meant that no discriminant function was capable of differentiating RA patients according compliance and noncompliance with their prescriptions.

The discriminant analysis for compliance with recommended exercise, reported in Table 17, computed a function with an eigenvalue of 0.04 that was nonsignificant ($p<0.01$). On this basis, it was decided to reject the function as being nonsignificant.

In addition to the cautions listed at the conclusion of the interpretation of the analysis for hypothesis 4, a definite shortcoming in drawing any conclusions from this analysis is warranted because of the single item nature of the measures used to assess compliance.

Summary

The following summarize the results of these analyses:

a) Measures of coping beliefs, coping practices and coping resources, as conceptualized by this study were significantly correlated with the two quality of life measures, though some of the measures within these coping dimensions had nonsignificant relationships to the quality of life measures.

2) Factor analysis was able to reduce the number of predictive constructs to four factors. These four factors were not representative of the coping dimensions hypothesized by the researcher.

3) Regression analyses of the quality of life measures by the coping measures did not produce regression equations that included measures from each of the researcher's hypothesized coping dimensions.

4) RA patients could be classified as being physically comfortable or physically discomforted on the basis of their scores on certain coping measures.

5) RA patients could be classified as being functional or dysfunctional on the basis of their scores on certain coping measures.

6) Discriminant analysis computed a function capable of differentiating patients using "high" active/ "low" passive coping styles from those using "high" passive/ "low" active coping styles on the basis of scores on certain coping and quality of life measures.

7) There were no significant differences in patients compliant with their prescriptions and recommended exercises from those who were noncompliant on the bases of their scores on the coping and quality of life measures.

Chapter V

Discussion

The present study was undertaken to evaluate measures of coping belief, coping practice and coping resource dimensions for their abilities to predict self-reported quality of life outcomes in a volunteer sample of rheumatoid arthritis (RA) patients. Interpretations of the findings shall be discussed in the following four sections of this chapter: A. Findings and Existing Research, B. Relevance of the Findings, C. Limitations of the Findings, D. Suggestions for Further Research, and E. Conclusion.

A. The Findings and Existing Research

The hypotheses tested in this research attempted to answer four questions stated earlier in Chapter 1 related to coping and its effects on quality of life in RA patients:

1. Would scores on measures representative of three hypothesized coping dimensions predict scores on measures of RA quality of life, and if so, could these measures be reduced to general coping factors consistent with these hypothesized dimensions?

2. What linear combinations of coping measures best predict quality of life in RA patients?

et al, 1988). This finding possibly resulted because of the use of an improved physical comfort measure (Callahan et al, 1988). Similar findings for functional ability were consistent with the Brown et al (1988) study.

Less distinct relationships were found between the other measures of coping practices and quality of life. The relationship of the other coping practice scale, alexithymia, with the quality of life measures was nonsignificant. This could indicate that emotional coping, as hypothesized by the alexithymia construct, is not an important variable to consider in assessing RA coping practices. This conclusion would not support the somatization hypothesis (Lipowski, 1987; Alexander & Benedek, 1950) and findings of other researchers suggesting that the repression of emotions, especially hostility, are common correlates of RA severity (McFarlane et al, 1987; Moos, 1964). Another interpretation of this finding could be that the operationalization used to assess this coping construct, the Toronto Alexithymia Scale (Taylor et al, 1985), is inadequate for these purposes. The single item measuring voluntary exercise was a general health behaviour that was weakly and negatively associated with both physical comfort and functional ability.

Only one measure of coping resources significantly predicted scores on both quality of life instruments. The punishing responses subscale of the West Haven-Yale Multidimensional Pain Inventory (MPI) weakly predicted both measures. The solicitous responses subscale of the MPI was weakly associated with lower levels of functional ability but was nonpredictive of levels of physical comfort as demonstrated in the studies of Turk and his colleagues (Flor et al, 1987; Turk & Rudy, 1988). This significant combination of both forms of support would seem to not have any similarities but could be seen as consistent when viewed from the perspective taken by Fordyce (1976). Scores on the distracting responses subscale of the MPI were, however, weakly and negatively related to physical comfort in the direction shown by Turk and Rudy (1988). This would also be consistent with the Fordyce (1976) pain behaviour model. The more general measure of social support was uncorrelated with either physical comfort or functional ability.

From the responses of patients who volunteered for this study, it would not appear that scores on the support subscales of the West Haven-Yale Multidimensional Pain Inventory provide as clear a means of classifying patients according to their quality of life as was shown in the Turk and Rudy (1988) study. Similar to the findings of the present study, Manne and Zautra (1989) found that spouse criticism was a better predictor of adaptive coping and quality of life (functional ability) than was supportive spouse interaction. However, the strength of these relationships in the present study were weak and caution should be used in drawing any conclusions regarding the differential effects of support received. It also should be reemphasized that over 40% of the sample was not married and would therefore have rated their support on the basis of interactions with a closest friend or relative. In order to more accurately assess the subjective perceptions of RA patients regarding their interactions with their most significant other, it may be necessary to use a more sensitive measurement procedure such as that used by Manne and Zautra.

Scores on the health-related hardiness measure (HRH), the other form of coping resource, were weakly and negatively correlated with physical comfort scores, and no significant relationship was found with functional ability. It would appear then that health-related hardiness is only marginally related to the selected RA quality of life measures, though the general hardiness measure has been found to correlate with RA patients' immune functioning (Okun et al, 1989). Furthermore, it was not associated with forms of support as hypothesized in the coping model of Gentry and Kobasa (1984). Again, this could have occurred because of the inadequacy of the instrument to assess accurately the presence of this resource in patients, or because hardiness is genuinely unrelated to coping with RA. The instrument's author, Pollock (1986), did not find significant relationships between health-related hardiness and measures of psychosocial adaptation in her small sample (n=20) of RA patients, but this instrument had not been used to predict physical comfort and functional ability. When the psychometric properties of the subscales of the HRH were analyzed, its subscales (Commitment r= .44, Challenge r= .59) did not meet the minimum criterion of internal consistency required to permit reliable conclusions from their use. Health-related hardiness, therefore, appears to be a measure of dubious value in assessing the coping capacities of individuals having RA.

The results of the factor analysis of the coping measures provided a clear demonstration that the proposed coping dimensions of beliefs, practices, and resources were either not appropriately tested or were inappropriate as a means conceptualizing coping with RA. The resulting four factor solution was very different from the proposed dimensions.

It would appear, from the measures included in the analysis, that measures of coping beliefs and coping practices are assessing a similar dimension of coping. This factor seems related to the perceptions that subjects had of their performance of certain global or specific behaviours which could be construed as forms of coping.

Forms of social support clustered together as a coping factor but the hardiness measure was not included in this factor as originally expected (i.e., as another measure of coping resources). Instead, it appeared as a separate factor. This finding, and the alpha coefficient for the full scale HRH of .72, would seem to dispute the conclusions of Hull et al (1989) that hardiness is not a unitary measure.

The other factor, an apparent measure of emotional coping, was unanticipated as a discrete form of coping, given the coping dimensions hypothesized. Factor analysis of the coping measures did not support the three dimensions of coping hypothesized in this study.

In summary, the significant results of correlational analysis provide qualified support for the hypothesized coping dimensions of beliefs, practices and resources. These were not confirmed when factor analysis was used to examine the basic constructs underlying the coping measures selected for this study. It appears instead that the coping measures selected reflect different dimensions of coping than those hypothesized and that some are not significant predictors of quality of life in RA.

2. What are the Best Linear Combinations of Coping Predictors to Scores on Quality of Life Measures?

From the correlational analysis, one can conclude that some coping predictors had stronger relationships to physical comfort and functional ability than others. Multivariate analysis permitted an understanding of the collective and discrete contributions that these measures demonstrated in predicting two forms of RA quality of life. These contributions were not consistent with the expectations of hypothesis 3, though the results still merit discussion.

In the case of both physical comfort and functional ability, the best predictors were measures of coping beliefs. Of all the coping measures administered, only the measure of self-efficacy beliefs (ASE) predicted functional ability, but it did so with a strong association. This would suggest that the ASE measures aspects of coping which were measured by the other instruments which had also demonstrated significant relationships with functional ability (active and passive coping, arthritis helplessness, punitive and solicitous support), otherwise they would have been included as significant predictors of this facet of the quality of life in RA.

In examining the similar analysis performed for physical comfort, one finds that subjects' beliefs in self-efficacy were most related to their level of physical comfort. Three other forms of coping response - helplessness, hardiness, and punitive responses from a spouse or other intimate - add marginally to the level of prediction of physical comfort beyond that explained by the subjects' self-efficacy beliefs. A subject's self-efficacy beliefs were more predictive of both forms of quality of life than the composite factor of which the measure of these beliefs was a part. It would appear, then that self-efficacy beliefs are by far the best predictor of quality of life for RA patients. Measuring other aspects of coping adds little to our understanding of how coping, in the broad sense of that term, relates to quality of life for these patients.

At this point, it makes sense to more closely examine the data to determine if self-efficacy is as comprehensive a measure of coping as has been suggested. To do this, further statistical analyses were performed with the scores on the ASE not included in the computations. In the first of these, regression analysis of the coping measures related to physical comfort was undertaken (see Table 18 in Appendix B). This revealed that the remaining belief measure, arthritis helplessness, was the best predictor followed by marginal increments in the resulting regression equation's predictive power contributed by the measures of health-related hardiness, punishing responses from a spouse or intimate, and passive coping. This linear combination was capable of accounting for 29% of the variance in physical comfort. With self-efficacy included, the earlier regression equation predicted 42% of the variance in physical comfort.

Table 19 in Appendix B shows the same analysis performed for functional ability. Arthritis helplessness was able to predict 20% of the variance in this facet of RA quality of life, with solicitous response from one's most significant other, active coping, and punishing responses from one's most significant other contributing a further 6% of variance in functional ability. The results of the earlier regression analysis, with only self-efficacy as a predictor, accounted for more than 50% of the variance in functional ability. Two conclusions can be drawn from these analyses: a) that coping beliefs, be they measures of helplessness or self-efficacy, are the most significant predictors of RA quality of life; and b) the Arthritis Self-Efficacy Scales measures aspects of coping that are both unique to that measure and common to the other significant coping predictors.

Factor analysis of the coping measures, excluding the ASE (see Table 20 Appendix B), reveals a very different configuration of the coping measures than was computed from the earlier factor analysis of all coping measures. In this case, a more clear cut factor related to forms of coping which are associated with negative quality of life outcomes is produced. This was confirmed in the subsequent regression analyses performed using this and the other new factors as predictors for both quality of life measures (See Tables 21 and 22 in Table B). This factor, hypothesized to measure passive emotional forms of coping, emerged as the only predictor of physical comfort and functional ability, and demonstrated modest and negative correlations with each quality of life measure.

In reviewing the significance of the coping measures selected for predicting quality of life in the present study, one can see that one measure, the Arthritis Self-Efficacy Scales, is capable of predicting almost all of the variance in physical comfort and functional ability measures that can be associated with the selected coping measures. In other words, of the coping measures selected for this study, the Arthritis Self-Efficacy Scales proved the best measure for predicting quality of life in RA patients, rendering most other measures redundant or marginally significant in their additive, predictive abilities.

3. Are There Differences in the Scores on Measures of Quality of Life and Coping Which Predict Active Coping Style From Passive Coping Style?

Studies have consistently shown that RA patients' self-reports of the use of active coping styles are related to a superior quality of life than those associated with patients' self-reports of the use of passive coping styles (Brown et al, 1988 Felton & Revenson, 1984; Revenson & Felton, 1989; Manne & Zautra, 1989; Parker et al, 1987). Correlational analysis in the present study supported those findings and it was decided to further assess the combination of quality of life and coping variables which could predict either style of coping. Regression analysis of the measures predicting both styles indicated that passive coping was associated predominantly with helplessness beliefs followed by decreasing contributions made by solicitous support from a significant other, punitive support from a significant other, alexithymia and pain (Table 13 in Appendix B). Active coping was associated primarily with beliefs in self-efficacy and marginally with health-related hardiness (Table 14 in Appendix B). The discriminant analysis indicated that the two groups could best be differentiated on the basis of scores on the following measures in descending order of importance: helplessness beliefs, distracting responses from a significant other, solicitious responses from a significant other, self-efficacy beliefs and alexithymia.

It is worth noting, again, that beliefs appear to play the most important role in self-reports of coping style, a finding which supports, in part, the earlier work of Felton & Revenson (1984) suggesting that primary appraisals of the threat posed by a chronic illness were the most important predictor of the choice of coping strategies. Also of interest was the finding that the two features measured by the quality of life instruments played nonsignificant or marginal roles in predicting endorsement of a coping style. This supports the contention that the exercise of pain or illness-related behaviours, which are assumed to be forms of coping in this research, bear little relation to patients' subjective evaluation of illness severity (Fordyce, 1988). The irony is that, while perceptions of pain or disability may be unrelated or marginally related to certain coping practices, the outcomes resulting from the practice of either style of coping predict very different levels in a patient's quality of life.

It also appears that RA patients' common belief that they can better manage their symptoms through passivity (Baum & Figley, 1985) is an erroneous assumption. As with other types of chronic pain patients, this passivity fosters symptoms of disuse (Bortz, 1984) and poorer quality of life outcomes (Fordyce, 1976). This conclusion is further supported by the regression analyses conducted for both quality of life measures using the single item demographic and health behaviour measures alone (See Table 7 and Table 10 in Appendix B). In both cases, self-reports of voluntary exercise were significantly related to higher levels of physical comfort and functional ability.

It appears, then, that the most significant predictors of coping style are beliefs such that beliefs in personal helplessness are associated with passive coping, while beliefs in self-efficacy predict active coping. Levels of physical comfort and functional ability bore little relation to the practice of either coping style when compared with measures of coping as predictors of coping style. Furthermore, active coping styles predicted superior quality of life outcomes.

4. Is There a Combination of Coping and Quality of Life Measures Capable of Predicting Differences in Treatment Compliance?

The short answer is no. Attempts to answer this question indicated that there was no combination of variables which could be used to differentiate subjects into treatment compliant or treatment resistant groups for either compliance with prescribed treatment or recommended exercise. Regression analysis indicated that no instruments used in this study could predict medication compliance and a weak negative relationship was found between the measure of general support and exercise compliance (see Table 23 and Table 24 in Appendix C). Correlational analysis between the demographic and health behaviour measures showed that compliance decreased with age and duration of illness, and, not surprisingly, those who reported that they voluntarily exercised were more compliant with their prescribed exercise program (see Table 3a in Appendix C).

The lack of significant associations between the measures used in this study and the measures of compliance could possibly indicate that these were irrelevant factors in treatment compliance. Other studies have shown that it is the beliefs in the efficacy of the **medication** (as opposed to the individual's coping efforts) that has contributed to compliance problems (Arluke, 1980; Belcon et al, 1985), or it could be that these are the result of problems Feinberg (1988) has suggested exist in the health-care provider-patient relationship. The findings of Lorish et al (1989) suggest that noncompliance problems are, more often than not, problems caused by such things as lapses in memories or disruptions in daily routines. One further possibility, when interpreting the present findings, is that the single item measures used did not adequately assess compliance.

In general, the findings of the present study suggest that the coping and quality of life measures used in the present study are nonpredictive of treatment compliance or resistance.

B. Relevance of the Findings

The relevance of the findings of this study can be seen in terms of the implications they have for the treatment of RA patients when seen as an adjunct to conventional treatment. Of secondary importance is the potential generalizability of the findings to other areas of research in health psychology and stress-coping.

1. Implications for Treatment

The position taken by the researcher, and supported by the findings of the present study, is that patients' coping responses do significantly contribute to their subjective experience of RA. The findings support the contention of Reid (1984) that patients exert some degree of "participatory control" in the treatment relationships they have with their health-care providers.

It would appear that how patients exercise this control is directly related to the disruption that RA symptoms can have to their quality of life. As shown in numerous studies, an active stance toward managing these symptoms is more beneficial than a passive stance (Affleck et al, 1987; Manne & Zautra, 1989; Parker et al, 1987; Revenson & Felton, 1989). However, the exercise of this control is essentially guided by the beliefs of patients regarding their potential to manage the symptoms of their illness, a finding consistent with other research in this area (Revenson & Felton, 1989; Felton & Revenson 1984). Coping beliefs, especially those related to managing the specific demands of daily living, appear to be most relevant in patients' efforts to optimize the treatment relationships they have with health-care personnel.

Patient education programs (Lorig et al; 1987; Mullen et al, 1987) and psychoeducational interventions (Appelbaum et al, 1988; O'Leary et al,1989; Parker et al, 1988a) have improved patients' quality of living. However, the curricula or objectives of these interventions seem crucial to the outcomes if one compares these results to those obtained as a result of similar but more general forms of psychoeducational intervention (Shearn & Fireman, 1985; Strauss et al, 1986). In a sense, a measure like the ASE (self-efficacy) can be seen as a set of educational objectives from which forms of educational activities designed to promote patients' attainment of those objectives could be prepared.

Beliefs appear to be an important facet of any form of psychoeducational intervention to bolster coping responses. Turk and his colleagues (1983) have commented that one of the most important aspects of pain management interventions is the reconceptualization, or alteration of beliefs regarding, chronic pain. This reconceptualization has been helpful to patients in acquiring new and beneficial coping practices. It is the stability of beliefs or conceptualizations regarding symptoms that is at issue. Maladaptive and stable beliefs apparently promote negative self-fulfilling prophecies in terms of quality of life outcomes.

Given the importance that beliefs have shown in relation to quality of life, it would seem crucial that patients learn to accurately appraise their abilities to perform daily activities on an ongoing basis. Blalock speculated from her findings that:

> "individuals may be able to both evaluate their disease-impaired abilities accurately and, at the same time, feel good about those abilities." (Blalock, 1987, p.140)

Evidence from Fordyce (1976) and others (Linton, 1985) confirms that chronic pain patients underestimate their abilities to perform activities. An important finding of the present study was that the practice of active forms of coping versus passive forms of coping bore virtually no relationship to self-reported pain and disability when compared to other coping measures. Bradley et al (1987) were able to assist RA patients in decreasing their pain behaviours and increasing their "well" behaviours, or functional ability, with no increase in the pain levels reported by these patients. It would seem, then, that patient education, involving both didactic and experiential forms of learning, is potentially an important part of RA treatment that may enable patients to modify beliefs and corresponding behaviours regarding their practice of health-promoting behaviours.

In sum, the results of this study, suggest that an important area for the treatment of RA patients involves addressing, through psychoeducational or other means, the beliefs that patients have regarding their abilities to minimize the disruptions caused to their quality of living due to the symptoms of RA. This likely would necessitate a team approach to patient care that would include the provision of educational or counselling assistance, an approach that has already been demonstrated to be more effective than conventional treatment (Ahlmen, Sullivan & Bjelle, 1988).

It would appear that some attention by health care providers to the patients' immediate social circumstances also may be appropriate. The responses, particularly those perceived as punitive, from spouses or other intimates are related to the patients' quality of life. Other research has shown that chronic illness disrupts the ill members ability to perform homemaking roles (Reisine et al, 1987) and may result in family dysfunction if members of the family are not able to accomodate the changes in the patient (Pym, 1987; Rolland, 1987). A lack of accomodation to the patient could be due to misunderstandings about RA and its symptoms which could be addressed through education or family counselling. This would particularly be relevant when family members "helpful" responses are clearly not helpful and encourage the type of passivity discussed earlier.

Another important implication of this study's findings relates to assessment procedures for arthritis patients. Meenan & Pincus (1988) have advocated improvements to the arthritis health status instruments they recently reviewed. In this review they suggested that these instruments should examine the capacities of greatest importance to patients. One possible extension of this idea would be to individualize part of the Arthritis Self-Efficacy Scales to assess as-yet unspecified areas for potential psychoeducational intervention which are salient to the individual patient. Suggestions for items to include in the ASE would likely be of the more general tasks involved in coping with chronic illness (e.g., Moos & Schaefer, 1984). Arrangements could then be made with the appropriate health-care personnel to work toward attainment of the patients' objectives for improvements in daily living.

Lorig et al (1989) have openly contemplated the strength of the relationship of the ASE (self-efficacy) with quality of life measures as a possible product of its similarities with these same measures. A number of the coping items in the ASE are worded in a manner similar to items found in the quality of life measures. For example, below are items from the (a) Arthritis Self-Efficacy Scales (ASE) and one from the (b) Physical Function Factor of the Arthritis Impact Measurement Scales (AIMSPF):

a. (Rate yourself on a scale of 10 to 100 according to how certain you are that you can) Button and unbutton three medium-size buttons in a row in 12 seconds.

b) Can you easily button articles of clothing? 1) Yes 2) No

Both measures ask patients to evaluate their abilities to perform certain tasks commonly affected by RA. However, the primary difference between the measures occurs in the range of possible reponses provided for indicating a negative or affirmative response to each particular item. With this as the primary difference, both could be considered measures of beliefs related to the performance of specific normal daily activities as opposed to the more global types of belief assessed by the Arthritis Helplessness Index (e.g., "Arthritis is controlling my life. - Strongly Agree to Strongly Disagree").

Rather than view the AIMSPF (Arthritis Impact Measurement Scales - Physical Function Factor) and ASE as confounded measures, it is useful to review their origins and purposes. The AIMS was developed as a measure of health status to provide health-care professionals with a means of assessing the degree of disruption that RA caused to common aspects of patients' lives (Meenan et al, 1980). Measures such as the AIMS were originally developed as clinical research tools, but a recent editorial in the Journal of Rheumatology (Meenan & Pincus, 1988) advocated that they be adapted for use in clinical practice. Their use, in this sense, would be not unlike taking a routine blood test. The results of self-reports of health status could permit health-care professionals to more fully understand the lifestyle implications of RA than their traditional measures of functional ability had permitted.

The ASE is a psychoeducational test used to assess beliefs regarding the performance of certain tasks or behaviours hypothesized to predict future health status. It is not unlike a pretest of learning abilities such as those given to school children. Having the belief or conviction that one can perform "stressful" tasks relegates the tasks to an ability within the individual's coping repertoire as opposed to a stress-provoking task (Bandura, 1986). This emphasis on personal conviction to perform the tasks specified on the ASE (self-efficacy) places some of the locus of responsibility for performance of those tasks with the individual and not solely with the status of the illness or success of its treatment.

It may seem that the point as to whether patients perceive their functional abilities as being under the "successful" control of the patients or health care personnel is moot, that the key is to alleviate these symptoms and permit a minimally dysfunctional lifestyle. However, studies have consistently suggested that patients need to perceive themselves as exerting or experiencing some degree of control over the symptoms of their illness (Crisson & Keefe, 1988; Reid, 1984; Strickland, 1989).

In the case of RA, the disease course is intermittent and uncertain. Flare-ups and remissions confront patients with changing challenges over which they could exercise varying degress of control. It appears that, for many, a stable and global belief in personal helplessness develops which is related to negative clinical findings and self-reports of well-being (Stein et al, 1988b). Reid's (1984) review of studies related to his construct, "participatory control", suggested that at different stages of illness or medical treatment, the level of control an individual requires varies.

Bandura and his colleagues (Bandura, O'Leary, Taylor, Gauthier & Gossard, 1987) recently offered further evidence as to how these beliefs may be important in managing pain. In a study of the effects of self-efficacy beliefs in reducing and tolerating the effects of experimental pain, they found that the strength of these beliefs was related to activations of opioid and nonopioid mechanisms involved in mediating pain reduction. It would appear then that a patient who must totally depend on treatments and an unpredictable illness course - without any conviction regarding their ability to alleviate some of the disruption caused by RA symptoms - is at the mercy of those treatments or symptom fluctuations. The ASE is a diagnostic tool that permits health-care providers with a means of assessing these convictions. Then, from these assessments, psychoeducational or physical therapy interventions to help patients acquire a realistic assessment of the degree of control they can exercise of their symptoms can be developed.

Another measurement issue which highlights differences between the Arthritis Impact Measurement Scales, or AIMS, (and similar health status measures) and the ASE derives from the literature on the problems involved in using patient self-reports regarding their health status. While measures like the AIMS have been found to have strong relationships with traditional measures of health status, the measured outcomes are also influenced by the psychological well-being of the patients responding to them (Spiegel et al, 1988). This finding has been supported, indirectly, in other studies of the appraisal processes of RA patients which have identified significant relationships between self-reports of pain and/or functional ability, with psychological measures of hypochondriasis (Lichtenberg et al, 1986), depression (Smith et al, 1988) and anxiety (Summers et al, 1988), or both depression and anxiety (Hawley & Wolfe, 1988; Parker et al, 1988a). Seen this way, the self-reports on measures of health status, like the AIMS, could be viewed as containing "noise" which detracts from a purer evaluation of health status.

The ASE sidesteps these issues and directly addresses the issues of quality of life as involving both psychological and health status factors which mediate the performance of basic activities of dalily living. Tying the assessment of quality of life to the belief that one can perform tasks necessary to achieve a level of quality of life puts patients' self-reports of health status in the patient's domain: subjective perceptions of abilities necessary for the activities of daily living. Though few studies have contrasted patient and physician evaluations of health, patients' perceptions have been shown in a non-RA population to be more predictive than physician assessment when related to subsequent patient health status and use of health care (e.g., Maddox & Douglass, 1973). Evidence shows that these perceptions of self-control are modifiable through psychoeducational interventions, with concomitant improvements in self reports of functional ability, physical comfort and psychopathologies such as depression (Lorig et al,1989; O'Leary et al, 1989; Regan et al, 1988). This further highlights the importance that assessments of self-efficacy beliefs may have for future treatment.

There are three important treatment implications stemming from the results of this study: a) RA patients' beliefs regarding their illness and potential coping responses appear to be an important consideration in any psychoeducational interventions planned as an adjunct to RA treatment. b) RA patients may need assistance in creating social support resources which facilitate effective coping and c) The Arthritis Self-Efficacy Scale is an important measure of RA patient self-care, with some potential for more patient-specific improvements.

b. Implications for Research in Stress and Coping

The failure of the present research to find statistical differences between measures of coping belief and coping practice is important when one examines most current approaches taken to this area of study. The majority of studies on coping with both chronic and acute forms of stress have employed the Lazarus and Folkman (1984) model. This model has broken coping down into a sequential process involving primary appraisals of external and internal emotional stressors and secondary appraisals of one's resources for countering them - followed by the deployment of coping practices deemed appropriate by the secondary appraisals (Folkman et al, 1986a). The most common method of assessing these coping practices, using the Ways of Coping Checklist (Folkman & Lazarus, 1980) or its modifications (e.g., Felton & Revenson, 1984; Regan et al, 1989), are essentially the same as that used in this study's primary coping practice measure, the Vanderbilt Pain Management Inventory.

Collinearity between the latter measure and the Arthritis Self-Efficacy Scales, found in the multivariate analyses performed, indicates that the belief and practice measures are assessing a similar dimension of coping. This being the case, one could draw several tentative conclusions: a) there is no temporal or cognitive separation between coping belief and coping practice; b) most coping practice measures, such as the one used in the present study, are insufficient as measures of "actual" coping; or c) coping practices are subsumed in the beliefs individuals have regarding their performance of those practices in certain circumstances in the manner suggested by Bandura (1986). It would seem imperative that this apparent anomaly be addressed by future research so as to provide less speculative conclusions.

Another generalization of the Lazarus-Folkman (Folkman et al, 1986; Lazarus & Folkman, 1984) coping model is that coping involves a dynamic changing process of appraisals and deployment of coping practices, when evidence here suggests that, with chronic stressors like RA, these appraisals and practices can become habitual. It is the stability of those appraisals and consequent practices which potentially promotes a poor quality of life. It would seem imperative, then, for adherents to the Lazarus-Folkman approach to stress-coping research to address this and the previous issue in order to better operationalize or conceptualize their model as it relates to coping with chronic illness.

The present study also identified an inability of the selected measures for each hypothesized coping dimension evaluated to explain associations with indices of health much beyond those associations predicted by coping beliefs alone. For example, the subjects' responses on the coping resource measures marginally accounted for their quality of life scores. This finding would seem at direct odds with Hobfoll's (1989) recent advocacy of a resource model for explaining coping outcomes. This may also highlight an inadequacy, however, in assessing subjects' resources.

In the case of managing coping tasks as enduring and odious as managing personal pain and discomfort, the findings of this study suggest that mediating effects of coping resources on the coping beliefs of individuals requires further study. Researchers in the area of social support have suggested that resources can contribute to the stressed individual's coping information, personal esteem, and instrumental coping efforts (Cohen & Wills, 1985; Cohen, 1988). Other research indicates that potential resources, however, may contribute to distress rather than ameliorating it (Abbey et al, 1986; Manne & Zautra, 1989; Wortman & Lehman, 1985). Agreeing with Hobfoll (1989), it would seem that perceptions of the importance and quality of resources are key, but again it is one's perceptions or beliefs regarding those coping resources which matters. However, the effects of perceived resources seem less direct for coping than beliefs regarding the practices used to cope and, at present there are inadequate instruments to measure these relationships.

While it is likely that there are reciprocal relations between the stress of chronic illness and the coping strategies used to manage that stress (Aldwin & Revenson, 1987), information from recent, controlled, psychoeducational treatment studies with RA patients (Appelbaum et al, 1988; Bradley et al, 1987; Lorig, et al, 1989; O'Leary et al, 1988; Parker et al, 1988b) indicates that enhanced coping can be associated with improvements in health status outcomes. Some of those improvements have been associated with changes in coping beliefs (e.g., Lorig et al, 1989). It would appear from this study that coping beliefs, based on the convictions of individuals that they can perform salient coping tasks, most adequately account for associations between individuals' responses to a chronic stressor like long-term illness, and their resulting quality of life. The interactional role that practices and resources play in fostering these beliefs requires the type of evaluation that could only be accounted for using complex longitudinal analyses.

C. Limitations and Delimitations of the Findings

While the present study has provided a number of significant contributions to the existing body of research on RA patient coping responses and quality of life, it is not without limitations and delimitations which must be considered when extrapolating these results, for comparison purposes, to other RA patient populations:

1. The sample represented a cross section of volunteering RA patients for whom supportive medical data regarding clinical features of their illness was unavailable. Caution regarding the use of volunteers (Rosenthal & Rosnow,1969) as subjects should be kept in mind when interpreting the results.

2. All data obtained in this study resulted from the self-reports of the RA patients who chose to participate. Their reports on the measures selected, including their self-reported diagnosis of RA which was accepted as valid,

were impossible to corroborate and must be accepted with the types of cautions and potential benefits that can be derived from self-report data (e.g., Hogan & Nicholson, 1988; Meenan & Pincus, 1988).

3. Patients had the option to participate in the study only if they: a) could read and write English (exceptions were made to interview 3 patients); b) were aware of the possibility to participate in the study through the various advertisements or recruitment posters they may have encountered, primarily in the Edmonton or Calgary urban areas ; c) lived in the Alberta or Northwest Territories region.

4. As a statistical study, this research is limited to making generalizations from patient volunteers' self-reports of coping and quality of living. Furthermore, these generalizations were made from scores on selected measures which could not capture all the dynamic facets of coping and quality of life. The findings must also be understood in relation to the psychometric properties of the measures used (see Table 2 in Appendix C). Because of this, the data must be viewed as a fuzzy snap-shot of certain general aspects of coping and quality of life when, in reality, large and subtle aspects of changing experience and behaviour have been obscured or omitted by design. More discussion regarding this limitation shall be emphasized in the section on suggestions for further research.

5. Participants in the study will be assisted in coping, to varying degrees, by the use of different pharmaceutical and medical treatments which are not included as variables used in the analysis of the data. Conversely, patients will be experiencing different levels of severity in terms of the

clinical features of their disease and this severity, or consideration of the clinical features, has also not been included in the data analysis. The desire to sample the general RA population is considered to be offset to some degree by the large sample size, but remains a limitation of the study's design.

6. Causality cannot be inferred from the correlational design of this study. References have been made to other controlled studies in which the findings suggest some degree of causality regarding the effects of enhanced coping on subsequent self-reports of quality of life, but no such claim regarding causality can be made from the present findings. Suggestions regarding this matter shall be made in the following section.

7. The multivariate statistical analyses performed provided exploratory findings require confirmation. Sample size was insufficient for performing recommended cross validation of the results (Betz, 1987). In particular, for there to be proper validation of the results, the regression equations and discriminant functions obtained should be used with future populations to check for their accuracy in classifying similar subjects (Stevens, 1986). Until this has been done, the results must be viewed as exploratory.

8. The data was not analyzed for gender, age, income, education, illness severity, medications, illness duration, and marital status variables. Significant differences may be evident in the choice of coping responses based on differences on these variables.

D. Suggestions for Further Research

The impetus for this study originated from the optimistic findings of health psychologists which have indicated that individuals who have chronic incurable illnesses can do things to improve their quality of life and optimize the treatment relationship they have with their health-care providers. As such, this study aimed at coming closer to answering the following question for one chronic illness population: **What can people with rheumatoid arthritis do to create the best quality of life possible for themselves given the fact of their illness?**

In keeping with the aims of answering this question, and from consideration of this study's findings and its limitations, the following are offered as suggestions for further research:

1) The present study was broad in scope but limited in its comprehensiveness. By design, this research used self-report measures of coping and quality of life which assessed **selected** aspects of both. For example, because of the delimitations of the study, data obtainable from the AIMS (Arthritis Impact Measurement Scales), on aspects of quality of life such as social interaction and affective symptoms, were not included for analysis. Similarly, a diverse number of coping measures exist which could have measured a number of features of coping. Further coping variables for this type of research could include: measures of hypnotizability (Hilgard & Hilgard, 1985), measures of distortion in cognitive appraisal (Smith et al, 1988), learned resourcefulness (Rosenbaum, 1983), self-disclosure (Jourard, 1970) and marital adjustment (Locke & Wallace, 1959).

2. This research did not use objective meaures of coping and health status. Without obtaining results on these measures, comparable to those found in the present study, legitimate skepticism can be directed toward the reported findings and means used to obtain them. Including such measures as spouse ratings of coping practices (Flor, Kerns & Turk, 1987), measures of observable pain and "well" behaviours (Anderson et, al, 1988), sociometric representations of social supports (Cohen & Wills, 1985) and clinical ratings of patient health status (e.g., Gresham, 1986) seems advisable.

3. The coping and quality of life instruments used in the present study have been recently developed and should be viewed as crude measures. A phenomenological study of RA coping at different stages of the illness (e.g. flare-ups, morning stiffness times, etc.), for example, would help to identify facets of coping not assessed in the present study. Extending this research further, new generalizations about coping with RA, identified as a result of the suggested study, could be used to improve the quality of the coping measures. A study of these new measures, similar to the present study, would help to refine both the coping measures and current understandings regarding relationships between RA patients' coping responses and their quality of life.

4. To the researcher's knowledge, this is the first study which has shown measures of coping beliefs and coping practices to be measuring essentially the same general construct. Most research to date has treated these dimensions of coping as being discrete. If replication of this study's

results occurs, the methods used for assessing coping practices, along with the theories of RA coping, would need revisions.

5. Studies regarding the acquisition, maintenance and modification of coping beliefs in RA patients and other chronic illness populations could have important implications for the preparation and implementation of patient education programs and other forms of psychoeducational intervention. This type of study may, for example, more clearly delineate the role that forms of social interaction and coping practices play in relation to coping beliefs.

6. It also appears important that the theoretical contention that self-efficacy beliefs are different from outcome expectancies needs support as it applies to these populations. Considering that the present study offered only a static measure of coping and quality of life, longitudinal studies of patients' self-efficacy beliefs, and the concomitants of those beliefs as patients go through flareup and remission phases of their illnesses, would seem the best way to evaluate that contention.

7. It would appear from the findings of this research that patients' beliefs regarding personal coping capacities are the most important coping predictors of their quality of life. However, consensus within the medical community regarding the importance and use of patients' beliefs in illness treatment does not exist. If patients are exhorted through forms of education to take more "participatory control" in their relationships with health care personnel, there could be treatment ramifications for both patients and health care providers. An earlier stated aim of this study was

to examine patient possibilities for optimizing those relationships. A longitudinal, sociological study should be conducted around the changes which occur in RA patient-health care personnel relations as patients attempt to assume more control in their treatment.

E. Conclusion

> Most authors appear to look for weaknesses in the defensive armor of arthritics rather than either looking for their adaptive modes of functioning or just describing, without evaluation, their characteristics. The emphasis on 'accentuating the negative' both obscures the necessarily present positive characteristics of individual arthritis and directs attention away from the adaptive integrative role that arthritis itself may play. (R. Moos, 1964, p.51)

It appears that there are ways in which some RA patients successfully manage, or adapt to, this illness' painful and potentially disabling symptoms. Above all, it appears that their beliefs regarding their abilities to manage these symptoms play an important role in their experience of those symptoms. Even more encouraging than the findings of the present study, is the recent consistent finding that there are ways to help RA patients improve their responses to this illness and live more satisfying lives as a result.

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APPENDIX A

MEASURES USED IN THE STUDY

"RESPONSES TO RHEUMATOID ARTHRITIS QUESTIONNAIRE"

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Rheumatoid Arthritis Patient Survey

This study is being conducted by Tom Strong, a doctoral student in the Department of Educational Psychology at the University of Alberta. The purpose of this study is to further our understandings as to how people sharing rheumatoid arthritis respond to this disease. The information will be potentially useful in improving treatments for the pain and disability of rheumatoid arthritis.

For the most part this survey consists of questions which ask you to choose one response from the possible responses shown. Please clearly indicate your choice by printing the letter of your chosen response for each item in the space provided on the right side of each page. In some cases you are asked to provide a written response to a statement or question. Please use the space provided and, if necessary, the back of the item's page. This survey should take approximately one hour to complete.

Please return the completed survey in the self-addressed, postage pre-paid envelope included with the survey. The results of the study should be complete and reported in the Edmonton Arthritis Society newsletter in September or October of 1989. If you have questions regarding this survey or my research, do not hesitate to contact me at 432-5205.

Demographic and Medical Status Questions
(Title not shown to respondents)

Please indicate your choice of response in the space provided to the right of each item.

1. Has a physician or specialist told you that you have rheumatoid arthritis?
   1) Yes 2) No ______

2. How long have you had this illness? a) less than 6 months; b) 6 months - 2 years; c) 2-5 years; d) 5-10 years; e) 10+ years

______

3. Please print in the space provided on the right your age. ______

4. What is your current marital status?
   a) single, never married; b) married; c) separated or divorced;
   d) widow or widower ______

5. Please indicate the highest level of education you completed: a) less than high school graduate; b) high school graduate; c) college or trade school graduate; d) university degree; e) university graduate (MA/MSC) or professional degree ______

6. Please indicate your household income category:
   a) less than $10,000 per annum; b) $10-20,000 per annum; c) $20-30,000; d) $30-45,000; e) $45,000+ ______

7. List on the lines below any other long-term illnesses or medical problems you have had or currently suffer from.

   ____

   ____

8. Have you recently (i.e., within the last 3 months) changed medications or begun some other form of treatment for rheumatoid arthritis?
   1) Yes 2) No ______

9. List the medications you are currently taking, and other treatments you are receiving.

   ____

   ____

10. When you get up in the morning do your joints feel stiff (as well as sore)?
    1) Yes 2) No ______

11. If you responded "Yes" to the previous question, how long does it take you to get loosened up in the morning: a) 15 minutes; b) 30 minutes; c) 1 hour; d) 1 and 1/2 hours; e) 2 hours; f) more than 2 hours

_____

12. Do you consider your disease to be active at the moment?
1) Yes 2) No _____

13. When was the last time you spoke with your family doctor or specialist about the symptoms of rheumatoid arthritis?
a) within the last month; b) within the last 3 months; c) within the last 6 months; d) within the last year; e) more than 1 year _____

14. I obtained this questionnaire: a) at a rheumatologist's office; b) by responding to an advertisement posted in my doctor's office; c) while attending a patient education class for arthritis; d) by responding to an advertisement in an Arthritis association newsletter; e) directly from the researcher _____

Arthritis Self-Efficacy Scales
(Title not shown to respondents)

In the following questions, we'd like to know how your arthritis pain affects you. For each of the following questions please indicate the exact number between 0 and 100 which corresponds to your certainty that you can now perform the following tasks in the space provided to the right of each question.

(Pain Subscale)
(Title not shown to respondents)

15. How certain are you that you can decrease your pain quite a bit?

10	20	30	40	50	60	70	80	90	100
very uncertain				moderately certain				very certain	

16. How certain are you that you can continue most of your daily activities?

17. How certain are you that you can keep arthritis pain from interfering with your sleep?

18. How certain are you that you can make a small-to-moderate reduction in your arthritis pain by using methods other than taking extra medication?

19. How certain are you that you can make a large reduction in your arthritis pain by using methods other than taking extra medication?

Function Subscale
(Title not shown to respondents)

We would like to know how confident you are in performing certain daily activities. For each of the following questions, please indicate the number which corresponds to your certainty that you can perform the tasks as of now without assistive devices or help from another person in the space provided on the right for each question. Please consider what you routinely can do, not what would require a single extraordinary effort.

AS OF NOW, HOW CERTAIN ARE YOU THAT YOU CAN:

20. Walk 100 feet on flat ground in 20 seconds?

10	20	30	40	50	60	70	80	90	100
very uncertain				moderately certain				Very certain	

21. Walk 10 steps downstairs in 7 seconds? _____

22. Get out of an armless chair quickly without using your hands for support? _____

23. Button and unbutton three medium-size buttons in a row in 12 seconds? _____

24. Cut 2 bite-size pieces of meat with a knife and fork in 8 seconds? _____

25. Turn an outdoor faucet all the way on and all the way off? _____

26. Scratch your upper back with both your right and left hands? _____

27. Get in and out of the passenger side of a car without assistance from another person and without physical aids? _____

28. Put on a long-sleeve front opening shirt or blouse (without buttoning) in 8 seconds? _____

Other Symptoms Subscale
(Title not shown to respondents)

In the following questions we'd like to know how you feel about your ability to control your arthritis. For each of the following questions please indicate the number which corresponds with the certainty that you can now perform the following activities or tasks in the space provided to the right for each question.

29. How certain are you that you can control your fatigue?

10	20	30	40	50	60	70	80	90	100
very uncertain			moderately certain				very certain		

_____

30. How certain are you that you can regulate your activity so as to be active without aggravating your arthritis? _____

31. How certain are you that you can do something to help yourself feel better if you are feeling blue? _____

32. As compared to other people with arthritis like yours how certain are you that you can manage arthritis pain during your daily activities? _____

33. How certain are you that you can manage your arthritis symptoms so that you can do the things you enjoy doing? ______

34. How certain are you that you can deal with the frustration of arthritis? ______

Arthritis Impact Measurement Scales
(Title not shown to respondents)

Instructions: Please answer the following questions about the way your arthritis affects your health. Indicate the appropriate number for your answer in the space provided to the right of each question.

Physical Function Subscale: Part 1
(This and the following subscale headings not shown to resondents)

35. When you travel around your community, does someone have to assist you because of your health? 1) Yes 2) No _____

36. Are you able to use public transportation?
1) No, because of my health 2) No, for some other reason
3) Yes, able to use public transportation _____

37. Do you have to stay indoors most or all of the day because of your health?
1) Yes 2) No _____

38. Are you in bed or in a chair for most or all of the day because of your health? 1) Yes 2) No _____

39. Does your health limit the kind of vigorous activities you can do such as running, lifting heavy objects or participation in strenuous sports?
1) Yes 2) No _____

40. Do you have any trouble either walking several blocks or climbing a few flights of stairs because of your health?
1) Yes 2) No _____

41. Do you have trouble bending, lifting or stooping because of your health?
1) Yes 2) No _____

42. Do you have any trouble either walking one block or climbing one flight of stairs because of your health? 1) Yes 2) No _____

43. Are you unable to walk unless you are assisted by another person or by a cane, crutches, artificial limbs, or braces?
1) Yes 2) No _____

44. Can you easily write with a pen or pencil? 1) Yes 2) No _____

45. Can you easily button articles of clothing? 1) Yes 2) No _____

46. Can you easily turn a key in a lock? 1) Yes 2) No _____

47. Can you easily tie a pair of shoes? 1) Yes 2) No _____

48. Can you easily open a new jar of food? 1) Yes 2) No _____

49. If you had the necessary transportation:
Could you go shopping for groceries or clothes...
1) Without help (taking care of all shopping needs yourself)
2) With some help (need someone to go with you to help on all shopping trips)
3) Or are you completely unable to do any shopping _____

50. If you had a kitchen:
Could you prepare your own meals...
1) Without help (plan and cook full meals yourself)
2) With some help (can prepare some things but unable to cook full meals yourself)
3) Or are you completely unable to prepare any meals _____

51. If you had household tools and appliances (vacuum, mops, etc.):
Could you do your housework...
1) Without help (can clean floors, windows, refrigerator, etc.)
2) With some help (can do light housework, but need help with some heavy work)
3) Or are you completely unable to do any housework _____

52. If you had laundry facilities (washer, dryer, etc.):
Could you do your own laundry...
1) Without help (take care of all laundry yourself)
2) With some help (can do small items only)
3) Or are you completely unable to do any laundry _____

53. If you had to take medicine:
Could you take all your own medicine...
1) Without help (in the right doses at the right time)
2) With some help (able to take medicine if someone prepares it for you and/or reminds you to take it) _____

54. Do you handle your own money?
1) Without help (write checks, pay bills, etc.)
2) With some help (day to day, but need help budgeting, etc.)
3) Or are you completely unable to handle any money _____

55. If you had a telephone would you be able to use it?
1) Without help
2) With some help (can answer phone or dial operator in an emergency, but need a special phone or help in getting the number or dialing)
3) Or are you completely unable to use the telephone _____

Social Activity Subscale

56. During the past month, about how often did you get together with friends or relatives?
1) Every day 2) Several days a week 3) About once a week 4) Two or three times in the past month 5) Once in the past month 6) Not at all in the past month ______

57. During the past month, about how often have you had friends or relatives over to your home?
1) Every day 2) Several days a week 3) About once a week 4) Two or three times in the past month 5) Once in the past month 6) Not at all in the past month ______

58. During the past month, how often have you visited with friends, or relatives at their homes?
1) Every day 2) Several days a week 3) About once a week 4) Two or three times in the past month 5) Once in the past month 6) Not at all in the past month ______

59. About how often were you on the telephone with close friends or relatives during the past month?
1) Every day 2) Several days a week 3) About once a week 4) Two or three times in the past month 5) Once in the past month 6) Not at all in the past month ______

Physical Function Subscale: Part 2

60. When you bathe, either a sponge bath, tub or shower, how much help do you need?
1) No help at all 2) Help with bathing one part of your body, like back or leg 3) Help in bathing more than one part of your body ______

61. How much help do you need in getting dressed?
1) No help at all 2) Only need help in tying shoes 3) Need help in getting dressed ______

62. How much help do you need to use the toilet?
1) No help at all 2) Only need help in getting to or using the toilet 3) Not able to get to the bathroom at all ______

63. How well are you able to move around?
1) Able to get in and out of bed or chairs without the help of another person 2) Need the help of another person to get in and out of bed or chair 3) Not able to get out of bed ______

Pain Subscale

64. During the past month, how would you describe the arthritis pain you usually have?
1) Very severe 2) Severe 3) Moderate 4) Mild 5) Very mild 6) None
_____

65. During the past month how often have you had severe pain from your arthritis?
1) Always 2) Very often 3) Fairly often 4) Sometimes 5) Almost never 6) Never
_____

66. During the past month, how long has your morning stiffness usually lasted from the time you wake up?
1) Over four hours 2) Two to four hours 3) One to two hours 4) Thirty minutes to an hour 5) Less than thirty minutes 6) Do not have morning stiffness
_____

67. During the past month, how often have you had pain in two or more joints at the same time?
1) Always 2) Very often 3) Fairly often 4) Sometimes 5) Almost never 6) Never
_____

Depression (DN) and Anxiety (AN) Subscales as indicated

(Titles and succeeding designations not shown to respondents)

68. During the past month, how much of the time have you enjoyed the things you do? DN
1) All of the time 2) Most of the time 3) A good bit of the time 4) Some of the time 5) A little of the time 6) None of the time
_____

69. During the past month, how much of the time have you felt tense or "high strung"? AN
1) All of the time 2) Most of the time 3) A good bit of the time 4) Some of the time 5) A little of the time 6) None of the time
_____

70. How much have you been bothered by nervousness, or your "nerves" during the past month? AN
1) Extremely so, to the point where I could not take care of things 2) Very much bothered 3) Bothered quite a bit by nerves 4) Bothered some, enough to take notice 5) Bothered just a little bit by nerves 6) Not bothered at all by this
_____

71. How often during the past month did you find yourself AN having difficulty trying to calm down?
1) Always 2) Very often 3) Fairly often 4) Sometimes 5) Almost never 6) Never
_____

72. During the past month, how much of the time have you been in low or very low spirits? DN
1) All of the time 2) Most of the time 3) A good bit of the time 4) Some of the time 5) A little of the time 6) None of the time ______

73. How much of the time during the past month did you feel relaxed and free of tension? AN
1) All of the time 2) Most of the time 3) A good bit of the time 4) Some of the time 5) A little of the time 6) None of the time ______

74. How much of the time during the past month have you felt downhearted and blue? DN
1) All of the time 2) Most of the time 3) A good bit of the time 4) Some of the time 5) A little of the time 6) None of the time ______

75. How often during the past month did you feel that nothing turned out the way you wanted it to? DN
1) Always. 2) Very often 3) Fairly often 4) Sometimes 5) Almost never 6) Never ______

76. How much of the time during the past month have you felt calm and peaceful? AN
1) All of the time 2) Most of the time 3) A good bit of the time 4) Some of the time 5) A little of the time 6) None of the time ______

77. During the past month, how often did you feel that others would be better off if you were dead? DN
1) Always 2) Very often 3) Fairly often 4) Sometimes 5) Almost never 6) Never ______

78. How much of the time during the past month were you able to relax without difficulty? AN
1) All of the time 2) Most of the time 3) A good bit of the time 4) Some of the time 5) A little of the time 6) None of the time ______

79. How often during the past month have you felt so down in the dumps that nothing could cheer you up? DN
1) Always 2) Very often 3) Fairly often 4) Sometimes 5) Almost never 6) Never ______

Health Perceptions Subscale

80. In general would you say your health is excellent, good, fair or poor?
1) Excellent 2) Good 3) Fair 4) Poor ______

81. Thinking about the past month, how much of the time has your health kept you from doing the kinds of things that you should be able to do?
1) All of the time 2) Most of the time 3) Some of the time 4) None of the time ______

Activities of Daily Living Pain Scale
(Title not shown to respondents)

Indicate the most appropriate answer with a

How often is it PAINFUL for you to:	Never	Sometimes	Most of The Time	Always
82. Dress yourself, including tying shoelaces and doing buttons?	____	____	____	____
83. Get in and out of bed?	____	____	____	____
84. Lift a full cup or glass to your mouth?	____	____	____	____
85. Walk outdoors on flat ground?	____	____	____	____
86. Wash and dry your entire body?	____	____	____	____
87. Bend down to pick up clothing from the floor?	____	____	____	____
88. Turn regular faucets on and off?	____	____	____	____
89. Get in and out of a car?	____	____	____	____

90. How Much Pain Have You Had Because Of Your Condition IN THE PAST WEEK? Place a mark on the line below to indicate how severe your pain has been:

No Pain ____ Pain as bad as it could be

Vanderbilt Pain Management Inventory

Subscales for each item designated by A = Active Coping & P = Passive Coping beneath each item number e.g. 91
A

(Above title and subscale designations not shown to respondents)

We would like to know how frequently you have the following thoughts or engage in the following behaviors only when your pain is at a MODERATE level of intensity or greater. Please indicate how frequently you do the following when experiencing pain by indicating the number of the response you choose in the right hand space provided.

1 - Never do when in pain 2 - Rarely do when in pain
3 - Occasionally do when in pain 4 - Frequently do when in pain
5 - Very Frequently do when in pain

91. Engaging in physical exercise or physical therapy .... _____
(A)

92. Saying to yourself, "I wish my doctor would prescribe
(P) better pain medication for me." .... _____

93. Ignoring the pain (not even recognizing that it is there).. (A) _____

94. Staying busy or active .... _____
(A)

95. Clearing your mind of bothersome thoughts or worries ...... _____
(A)

96. Thinking, "This pain is wearing me down." .... _____
(P)

97 Talking to others about how much your pain hurts .... _____
(P)

98. Reading .... _____
(A)

99. Praying for relief .... _____
(P)

100. Restricting or canceling your social activities .... _____

101. Depending on others for help with daily tasks .... _____
(P)

102. Participating in leisure activities
(A) (such as hobbies, sewing, stamp collecting, etc.) .... _____

103. Thinking, "I can't do anything to lessen this pain." ...... _____
(P)

104. Distracting your attention from the pain (recognizing
(A) you have pain but putting your mind on something else) .... _____

105. Taking medication for purposes of immediate pain relief ... _____
(A)

106. Calling or seeing the doctor or nurse for help or advice .. _____
(P)

107. Focusing on where the pain is and how much it hurts .... _____
(P)

108. Keeping angry, depressed, or frustrated feelings inside ... _____
(P)

Toronto Alexithymia Scale

INSTRUCTIONS:

Subscales for each item designated by IF = Identify Feeligns & Sensations, D = Daydreaming, DF = Describe Feelings, and E0 = Externally Oriented. The designations shall be shown at the end of each item e.. "Know why ... (IF) 1

(Above title and subscale designations not shown to respondents)

Choose only one answer for each statement from each of the following responses: (1) Strongly Disagree, (2) Moderately Disagree, (3) Neither Disagree nor Agree, (4) Moderately Agree, (5) Strongly Agree. Show your answer in the space provided to the right of each question.

109. When I cry I always know why ....(IF) _____

110. Daydreaming is a waste of time ....(D) _____

111. I wish I were not so shy ....(DF) _____

112. I am often confused about what emotion I am feeling ...(IF) _____

113. I often daydream about the future ....(D) _____

114. I seem to make friends as easily as others do ....(DF) _____

115. Knowing the answers to problems is more important than knowing the reasons for the answers ....(EO) _____

116. It is difficult for me to find the right words for my feelings ....(DF) _____

117. I like to let people know where I stand on things .....(DF) _____

118. I have physical sensations that even doctors don't understand ....(IF) _____

119. It's not enough for me that something gets the job done; I need to know why and how it works...................(EO) _____

120. I'm able to describe my feelings easily ....(DF) _____

121. I prefer to analyze problems rather than just describe them ....(EO) ______

122. When I am upset, I don't know if I am sad, frightened, or angry ....(IF) ______

123. I use my imagination a great deal ....(D) ______

124. I spend much time daydreaming whenever I have nothing else to do ....(D) ______

125. I am often puzzled by sensations in my body ....(IF) ______

126. I daydream rarely ....(D) ______

127. I prefer to just let things happen rather than to understand why they turned out that way ....(EO) ______

128. I have feelings that I can't quite identify ....(IF) ______

129. Being in touch with emotions is essential ....(EO) ______

130. I find it hard to describe how I feel about people ....(DF) ______

131. People tell me to describe my feelings more ....(DF) ______

132. One should look for deeper explanations ....(EO) ______

133. I don't know what's going on inside me ....(IF) ______

134. I often don't know why I am angry ....(IF) ______

Health Behaviour Questions
(Title not shown to respondents)

Indicate your answer in the space provided on the far right side for each item or, where indicated, in blank lines following the item. For these latter questions you may continue your answer on the back of the page.

135. I follow my prescription(s): a) exactly as indicated b) regularly, but not exactly as indicated c) when I feel I need them d) never _____

136. I practice the exercises recommended to me by my physician or physical therapist: a) exactly as indicated b) regularly, but not exactly as indicated c) when I feel I need them d) never _____

137. I have tried to adapt to having rheumatoid arthritis by finding new enjoyable activities to take the place of those I found were becoming more difficult.
a) definitely not b) no c) yes d) definitely yes _____

138. List any changes you have made in the way you live your life as a response to having rheumatoid arthritis:

____

____

____

____

139. There are a number of relaxing activities (example: reading) I do daily that enable me to forget about having RA.

a) definitely not b) no c) yes d) definitely yes _____

140. I take part in some form of exercise (other than those prescribed by a physical therapist) at least 3 times a week.

a) definitely not b) no c) yes d) definitely yes _____

141. I have tried to modify my physical activities to reflect my energy levels and potential for making my arthritis symptoms worse.

a) definitely not b) no c) yes d) definitely yes _____

142. Aside from medication, what do you feel you do that best helps you to cope with the symptoms of rheumatoid arthritis?

____

____

143. What is the most troubling aspect of having to live with rheumatoid arthritis?

____

____

Arthritis Helplessness Index - Helplessness Subscale
(Title not shown to respondents)

Please answer every item, but pick only one response for each statement. These items measure your own beliefs, so there are no right or wrong responses. Choose the response which best describes what you believe and indicate it in the space provided to the right of each question.

1 - Strongly Disagree
2 - Moderately Disagree
3 - Slightly Disagree
4 - Slightly Agree
5 - Moderately Agree
6 - Strongly Agree

144. Arthritis is controlling my life. 1 2 3 4 5 6 .... _____

145. I would feel helpless if I couldn't rely on other people for help with my arthritis. 1 2 3 4 5 6 .... _____

146. No matter what I do, or how hard I try, I just can't seem to get relief from my pain. 1 2 3 4 5 6 .... _____

147. I am coping effectively with my arthritis.1 2 3 4 5 6 .... _____

148. It seems as though fate and other factors beyond my control affect my arthritis. 1 2 3 4 5 6 .... _____

(*Item 147 Recoded as follows 1=6, 2=5, 3=4, 4=3, 2=1, 1=6)

West Haven - Yale Multidimensional Pain Inventory
Support Subscale
(Title not shown to respondents)

In the following questions, you will be asked to describe your pain and how it affects your life. Under each question is a scale to record your answer. Read each question carefully and then select a number on the scale under that question to indicate how that specific question applies to you. Show your answer for each question in the space provided to the right of each question. An example may help you to better understand how you should proceed to answer these questions.

Example

How frequently do you read the newspaper?
0 1 2 3 4 5 6
Never Daily ______

149. How supportive or helpful is your spouse (or, relative or friend who you feel closest to) to you in relation to your pain?

0 1 2 3 4 5 6
Not at all supportive   Extremely supportive ______

150. How worried is your spouse (or, relative or friend who you feel closest to) about you in relation to your pain problem?

0 1 2 3 4 5 6
Not at all worried   Extremely worried ______

151. How attentive is your spouse (or, relative or friend who you feel closest to) to your pain problem?
0 1 2 3 4 5 6
Not at all attentive   Extremely attentive ______

Punishing, Solicitous & Distracting Responses Subscales
Punishing responses = P, Solicitous Responses = S, Distracting Responses = D)

(Above subscale headings and designations not shown to respondents)

In this section, we are interested in knowing how your spouse (or relative or friend who you feel closest to) responds to you when he or she knows that you are in pain. On the scale listed below each question, choose a number to indicate how often your spouse (or relative or friend who you feel closest to) responds to you in that particular way when you are in pain. Please answer all of the 14 questions by showing your answers in the space provided to the right of each question.

152. Ignores me.
(P) 0 1 2 3 4 5 6
Never Very often ______

153. Asks me what he/she can do to help.
(S) 0 1 2 3 4 5 6
Never Very often ______

154. Reads to me.
(D) 0 1 2 3 4 5 6
Never Very often ______

155. Expresses irritation at me.
(P) 0 1 2 3 4 5 6
Never Very often ______

156. Takes over my jobs or duties.
(S) 0 1 2 3 4 5 6
Never Very often ______

157. Talks to me about something else to take my mind off the pain.
(D) 0 1 2 3 4 5 6
Never Very often ______

158. Expresses frustration at me.
(P) 0 1 2 3 4 5 6
Never Very often ______

159. Tries to get me to rest.
(S) 0 1 2 3 4 5 6
Never Very often ______

160. Tries to involve me in some activity.
(D) 0 1 2 3 4 5 6
Never Very often ______

161. Expresses anger at me.
(P) 0 1 2 3 4 5 6
Never Very often ______

162. Gets me some pain medications.
(S) 0 1 2 3 4 5 6
Never Very often ______

163. Encourages me to work on a hobby.
(D) 0 1 2 3 4 5 6
Never Very often ______

164. Gets me something to eat or drink.
(S) 0 1 2 3 4 5 6
Never Very often ______

165. Turns on the T.V. to take my mind off my pain.
(D) 0 1 2 3 4 5 6
Never Very often ______

Health Related Hardiness Scale

Subscales shall be designated at the end of each item as follows: Commitment = CT, Control = CL, Challenge = CH, e.g. "to blame .. CL"

(Above title and subscale designations not shown to respondents)

Instructions: This is a questionnaire designed to determine the way in which different people view certain important issues related to their health. Each item is a belief statement with which you may agree or disagree. For each statement, please choose the most appropriate response for you and show your response in the space provided to the right. The possible responses are:

1 - Strongly Disagree	4 - Slightly Agree
2 - Moderately Disagree	5 - Moderately Agree
3 - Slightly Disagree	6 - Strongly Agree

166. When I get sick I am to blame. (CL) 1 2 3 4 5 6 _____

167. I can avoid illness, if I take care of myself. (CL) 1 2 3 4 5 6 _____

168. I find it difficult to imagine enthusiasm about good health. (CH) 1 2 3 4 5 6 _____

169. Luck plays a big part in determining how soon I will recover from an illness. (CL) 1 2 3 4 5 6 _____

170. No matter how hard I try to maintain my health, my efforts will accomplish very little. (CT) 1 2 3 4 5 6 _____

171. I am in control of my health. (CL) 1 2 3 4 5 6 _____

172. I admire people who work hard to improve their health. (CT) 1 2 3 4 5 6 _____

173. It is more important to have financial security than good health. (CH) 1 2 3 4 5 6 _____

For each statement, please choose the most appropriate response for you and show your response in the space provided to the right. The possible responses are:

1 - Strongly Disagree	4 - Slightly Agree
2 - Moderately Disagree	5 - Moderately Agree
3 - Slightly Disagree	6 - Strongly Agree

174. The ideas about health promotion and illness prevention are social inventions to limit freedom of action. (CT) 1 2 3 4 5 6 _____

175. My good health is largely a matter of good fortune. (CL) 1 2 3 4 5 6 _____

176. No matter what I do, I'm likely to get sick. (CL) 1 2 3 4 5 6 _____

177. I find it boring to eat and exercise properly to maintain my health. (CH) 1 2 3 4 5 6 _____

178. The main thing which affects my health is what I myself do. (CL) 1 2 3 4 5 6 _____

179. Changes taking place in health care are not exciting to me. (CH) 1 2 3 4 5 6 _____

180. I find people who are involved in health promotion interesting. (CH) 1 2 3 4 5 6 _____

181. Setting goals for health is unrealistic. (CT)1 2 3 4 5 6 _____

182. Most things that affect my health happen to me by accident. (CL) 1 2 3 4 5 6 _____

183. Close relationships with others contribute to my mental and physical well-being. (CT) 1 2 3 4 5 6 _____

184. Changes taking place in health care will have no effect on me. (CH) 1 2 3 4 5 6 _____

185. If I get sick, it is my own behavior which determines how soon I get well again. (CL) 1 2 3 4 5 6 _____

186. I do not find it interesting to learn about health. (CH) 1 2 3 4 5 6 _____

187. I will stay healthy if it's meant to be. (CL) 1 2 3 4 5 6 _____

188. I am not interested in exploring new health care regimens or programs to improve my health. (CH) 1 2 3 4 5 6 _____

189. A close relationship with my family has no effect on my health. (CT) 1 2 3 4 5 6 _____

190. The only reason to be involved in the health promotion movement is to increase my lifespan. (CH) 1 2 3 4 5 6 _____

For each statement, please choose the most appropriate response for you and show your response in the space provided to the right. The possible responses are:

1 - Strongly Disagree	4 - Slightly Agree
2 - Moderately Disagree	5 - Moderately Agree
3 - Slightly Disagree	6 - Strongly Agree

191. No matter what I do, if I am going to get sick, I will get sick. (CL) 1 2 3 4 5 6 _____

192. I feel no need to try to maintain my health, because it makes no difference anyway. (CT) 1 2 3 4 5 6 _____

193. The current focus on health promotion is a fad that will probably disappear. (CH) 1 2 3 4 5 6 _____

194. No matter how hard I work to promote health for society, it never seems to improve. (CT) 1 2 3 4 5 6 _____

195. Our society holds no worthwhile goals or values about health. (CT) 1 2 3 4 5 6 _____

196. If I take the right actions, I can stay healthy. (CL) 1 2 3 4 5 6 _____

197. I get excited about the possibility of improving my health. (CH) 1 2 3 4 5 6 _____

198. I am determined to be as healthy as I can be. (CT) 1 2 3 4 5 6 _____

For each statement, please choose the most appropriate response for you and show your response in the space provided to the right. The possible responses are:

1 - Strongly Disagree	4 - Slightly Agree
2 - Moderately Disagree	5 - Moderately Agree
3 - Slightly Disagree	6 - Strongly Agree

199. When my health is threatened, I view it as a challenge that must be overcome. (CH) 1 2 3 4 5 6 _____

200. I read everything I can about health. (CT) 1 2 3 4 5 6 _____

201. I can be as healthy as I want to be. (CL) 1 2 3 4 5 6 _____

202. I see nothing wrong with taking risks with my health. (CT) 1 2 3 4 5 6 _____

203. When something goes wrong with my health, I do everything I can to get at the root of the problem. (CH) 1 2 3 4 5 6 _____

204. I have little influence over my health. (CL) 1 2 3 4 5 6 _____

205. Adequate rest is part of my daily routine. (CT) 1 2 3 4 5 6 _____

APPENDIX B

TABLES

SUMMARY OF STATISTICAL ANALYSES

Table 2
DESCRIPTIVE STATISTICS AND CRONBACH'S ALPHA OF THE INSTRUMENTS FOR THE SAMPLE

Measure	Mean	Standard Deviation	Actual Range of Scores Minimum	Maximum	Internal N	Range of Consistency	Possible Scores
AHI	15.084	5.472	5	28	235	0.6998	5 - 30
ASE	1177.00	394.458	200	1970	210	0.9276	200 - 2000
AIMSPF	36.054	4.805	23	55	226	0.7718	26 - 60
ADLPAIN	20.304	7.123	8	34	228	0.8503	8 - 42
TAS	66.565	11.157	39	91	220	0.7064	26 - 130
VPMI-A	23.700	5.185	2	35	229	0.7575	7 - 35
VPMI-P	28.797	6.912	11	46	227	0.7678	11 - 55
MPI-S	15.268	4.516	2	21	236	0.8618	3 - 21
MPI-PR	9.417	5.669	4	28	235	0.8074	4 - 28
MPI-SR	24.872	9.080	6	42	232	0.8256	6 - 42
MPI-DR	13.311	5.280	4	28	231	0.6985	4 - 28
HRH	160.649	18.997	44	206	216	0.7163	40 - 240

AHI = Arthritis Helplessness Index / **ASE** = Arthritis Self-Efficacy Scales / **AIMSPF** = Arthritis Impact Measurement Scales-Physical Function Factor / **ADLPAIN** = Activities of Daily Living Pain Scale / **VPMI-A** = Vanderbilt Pain Management Inventory - Active Coping Scale / **VPMI-P** Vanderbilt Pain Management Inventory - Passive Coping Scale / **TAS** = Toronto Alexithymia Scale / **MPI-S** = West Haven-Yale Multidimensional Pain Inventory - Support Subscale / **MPI-PR** / West Haven-Yale Multidimensional Pain Inventory - Punishing Response Subscale / **MPI-SR** West Haven-Yale Multidimensional Pain Inventory - Solicitous Responses Subscale / **MPI-DR** West Haven-Yale Multidimensional Pain Inventory - Distracting Responses Subscale / **HRH** = Health-Related Hardiness Scale

Table 3a
PEARSON CORRELATIONS AMONG DEPENDENT, DEMOGRAPHIC AND HEALTH BEHAVIOUR VARIABLES

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Duration	1.00													
2 Age	.18**	1.00												
3 Marital Status:	.00	.05	1.00											
4 Education	-.04	.16**	-.01	1.00										
5 Income	-.08	-.08	.45***	.38***	1.00									
6 Other Illnesses	-.07	-.07	.09	.02	.11*	1.00								
7 Illness Severity	.13	.20*	.04	-.05	.05	-.07	1.00							
8 Exercising?	-.07	-.03	-.02	.10	.01	-.11*	-.08	1.00						
9 Modifying Activities	.00	-.03	-.06	.10	.20**	-.12*	.05	.17**	1.00					
10 Med. Compliance	-.19**	-.19**	.00	-.08	.04	.04	-.01	.08	-.04	1.00				
11 Ex.Compliance	-.17**	-.13*	-.08	.01	-.01	.07	.15	-.16**	-.10	.30***	1.00			
12 Adaptation to RA?	.12*	-.13*	-.06	-.06	-.07	-.10	.02	.14*	.17**	-.31***	-.11	1.00		
13 ADLPN	.02	.00	.00	-.13*	-.08	-.01	.10	-.29***	-.07	-.13*	.00	.00	1.00	
14 AIMSPF	.08	.10	-.02	-.22***	-.11*	.03	.13	-.33***	-.10	-.04	.08	.09	.54***	1.00

(N=225) $^{***}p<.001$ $^{**}p<.01$ $^{*}p<.05$

ADLPN= Activities of Daily Living Pain Scale/ AIMSPF= Arthritis Impact Measurement Scales-Physical Function Factor

Table 6
Forward Multiple Regression: Physical Comfort by All Measures (Excluding AIMSPF)

Criterion	Predictor	Mult. R	Adj. R^2	F	Beta	p<
ADLPAIN	1 ASE	.58	.33	46.02	-.58	.000
(N=201)	2 VPMIP	.60	.35	26.01	.05	.05

Standard Error= 5.83 Constant= 24.58

AIMSPF= Arthrtis Impact Measurement Scales Physical Function Factor/ ADLPAIN=Activities of Daily Living Pain Scale/ ASE= Arthritis Self-Efficacy Scale/ VPMIP=Vanderbilt Pain Management Inventory - Passive Coping Subscale

Table 7
Forward Multiple Regression: Physical Comfort by Demographic and Health Behaviour Measures

Criterion	Predictor	Mult. R	Adj. R^2	F	Beta	p<
ADLPAIN	1 Exercising?	.29	.07	-.31	-2.75	.01
(N=95)	2 Adaptation	.36	.11	.21	2.24	.05

Standard Error= 6.78 Constant= 20.61

ADLPAIN=Activities of Daily Living Pain ScaleExercising?= Voluntarily exercises at least 3 times per week/ Adaptation=Has adapted activities in response to having RA

Table 9

Forward Multiple Regression: Functional Ability by all Predictor Measures (Excluding ADLPAIN)

Criterion	Predictor	Mult. R	Adj. R^2	F	Beta	p<
AIMSPF	1 ASE	.69	.47	79.81	-.66	.000
(N=94)	2 MPIPR	.71	.51	45.50	.27	.000
	3 MPIS	.73	.52	35.05	.19	.05
	4 TAS	.75	.54	33.85	-.16	.05

Standard Error= 2.97 Constant=43.77

AIMSPF= Arthritis Impact Measurement Scales Physical Function Factor/ ASE= Arthritis Self Efficacy Scales/ MPIS= West Haven-Yale Multidimensional Pain Inventory- Support Subscale/ TAS= Toronto Alexithymia Scale

Table 10

Forward Multiple Regression: Functional Ability by Health Behaviour and Demographic Measures

Criterion	Predictor	Mult. R	Adj. R^2	F	Beta	p<
AIMSPF	1 Exercising?	.26	.06	4.66	-.29	.01
(N=95)	2 Adaptation?	.34	.10	4.65	.21	.05

Standard Error=4.28 Constant= 36.00

AIMSPF= Arthritis Impact Measurement Scales Physical Function Factor/ Exercising= Voluntarily exercises at least 3 times per week/ Adaptation= Has adapted activities because of having RA

Table 13
Forward Multiple Regression: Passive Coping by Coping and Quality of Life Measures

Criterion	Predictor	Mult. R	Adj. R2	F	Beta	p<
VPMIP (N=230)	1 AHI	.52	.27	85.43	.39	.000
	2 MPISR	.55	.30	50.35	.26	.000
	3 MPIPR	.59	.34	41.13	.20	.01
	4 TAS	.61	.36	33.05	.14	.01
	5 ADLPAIN	.62	.37	27.70	.13	.05

Standard Error= 5.48 Constant= 5.97

VPMIP=Vanderbilt Pain Management Inventory - Passive Coping Subscale/ AHI= Arthritis Helplessness Index/ MPISR= West Haven-Yale Multidimensional Pain Inventory - Solicitious Responses Subscale/ MPIPR=West Haven-Yale Multidimensional Pain Inventory- Punishing Responses Subscale/ TAS= Toronto Alexithymia Scale/ ADLPAIN=Activities of Daily Living Pain Scale

Table 14
Forward Multiple Regression: Active Coping by Coping and Quality of Life Measures

Criterion	Predictor	Mult. R	Adj. R2	F	Beta	p<
VPMIA (N=230)	1 ASE	.49	.23	70.47	.49	.000
	3 HRH	.50	.24	37.95	-.12	.05

Standard Error= 4.37 Constant= 21.43

VPMIA-Vanderbilt Pain Management Inventory - Active Coping Subscale/ASE= Arthritis Self-Efficacy Scale/ HRH= Health-Related Hardiness

Table 18
Forward Multiple Regression: Physical Comfort by Coping Measures (Excluding ASE)

Criterion	Predictor	Mult. R	Adj. R2	F	Beta	p<
ADLPAIN	1 AHI	.49	.23	68.11	.40	.000
(N=185)	2 HRH	.52	.27	41.42	-.20	.01
	3 MPIPR	.54	.28	30.28	.15	.05
	4 VPMIP	.55	.29	24.12	.14	.05

Standard Error= 5.44 Constant= 32.77

ASE= Arthritis Self-Efficacy Scales/ AHI= Arthritis Helplessness Index/ HRH= Health-Related Hardiness/MPIDR= West Haven-Yale Multidimensional Pain Inventory - Punishing Responses Subscale/ VPMIP=Vanderbilt Pain Management Inventory - Passive Coping Subscale

Table 19
Forward Multiple Regression: Functional Ability by Coping Measures (Excluding ASE)

Criterion	Predictor	Mult. R	Adj. R2	F	Beta	p<
AIMSPF	1 AHI	.45	.20	57.03	.35	.000
	2 MPISR	.48	.23	24.12	.22	.000
	3 VPMIA	.50	.25	25.18	-.17	.01
	4 MPIPR	.52	.26	21.03	.16	.05

(N=182)

Standard Error= 4.00 Constant= 30.20

ASE= Arthritis Self-Efficacy Scales/ AIMSPF= Arthritis Impact Measurement Scales PhysicalFunction Factor/AHI= Arthritis Helplessness Index/ MPISR= West Haven-Yale Multidimensional Pain Inventory - Solicitous Responses Subscale/ VPMIA= Vanderbilt Pain Management Inventory - Active Coping Subscale/ MPIPR= West West Haven-Yale Multidimensional Pain Inventory Punishing Responses SubscaleSubscale

Table 20

Factor Analysis of Coping Predictor Measures (Excluding ASE)

Measures	Factor 1	Factor 2	Factor 3	Communality
MPISR	.88			.79
MPIS	.82			.70
MPIDR	.78			.64
MPIPR	-.60	.49		.65
VPMIP		.84		.74
AHI		.76		.65
TAS		.53		.30
HRH			.81	.67
VPMIA		-.46	-.51	.48
Eigenvalue	2.49	2.08	1.05	
Percent of Variance	27.6%	23.1%	11.6%	
Cumulative Percent	27.6%	50.7%	62.4%	

(N=232) Bartlett Test of Sphericity=490.81 Significance=0.000
(Extraction=Principal Components/ Rotation= Varimax Converged in 4 Iterations)

MPISR=(West Haven-Yale) Multidimensional Pain Inventory - Solicitous Responses Subscale/ MPIS=Multidimensional Pain Inventory - Support Subscale MPIDR= Multidimensional Pain Inventory - Distracting Responses Subscale/ MPIPR= Multidimensional Pain Inventory - Punishing Responses Subscale/ AHI=Arthritis Helplessness Index - Helplessness Factor/ VPMIA= Vanderbilt Pain Management Inventory - Active Coping Subscale/ VPMIP= Vanderbilt Pain Management Inventory - Passive Coping Subscale/ TAS= Toronto Alexithymia Scale/ HRH=Health-Related Hardiness Scale

Table 21
Forward Multiple Regression: Physical Comfort by Factors
With ASE Excluded

Criterion	Predictor	Mult. R	Adjusted R2	F	Beta	p<
ADLPAIN (N=182)	1 Factor 2	.47	.21	47.03	.47	.000

Standard Error= 5.88 Constant=20.45

ASE= Arthritis Self-Efficacy Scales/ ADLPAIN=Activities of Daily Living Pain Scale/ Factor 2=Passive - Emotional Coping

Table 22
Forward Multiple Regression: Functional Ability by Factors
With ASE Excluded

Criterion	Predictor	Mult. R	Adjusted R2	F	Beta	p<
AIMSPF (N=182)	1 Factor 2	.45	.20	51.27	.45	.000

Standard Error= 4.03 Constant= 36.06

ASE= Arthritis Self-Efficacy Scales/ AIMSPF= Arthritis Impact Measurement Scales - Physical Function Factor/ Factor 2=Passive - Emotional Coping

Table 23
Summary Oneway ANOVA Table for Physical Comfort By Duration of RA

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	4	106.82	26.70	.53	.71
Within Groups	226	11301.17	50.01		
Total	230	11407.98			

Table 24
Summary Oneway ANOVA Table for Functional Ability By Duration of RA

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	4	133.80	33.45	1.60	.17
Within Groups	226	4720.62	20.89		
Total	230	4854.42			

Table 25
Summary Oneway ANOVA Table for Physical Comfort By Marital Status

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	28.38	9.46	.19	.90
Within Groups	228	11492.06	50.40		
Total	231	11520.44			

Table 26
Summary Oneway ANOVA Table for Functional Ability By Marital Status

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	5.54	1.85	.08	.97
Within Groups	228	5130.94	22.50		
Total	231	5136.48			

Table 27
Summary Oneway ANOVA Table for Physical Comfort By Education

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	4	345.20	86.30	1.75	.13
Within Groups	227	11175.25	49.23		
Total	231	11520.44			

Table 28
Summary Oneway ANOVA Table for Functional Ability By Education

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	4	261.10	65.27	3.04	.02
Within Groups	227	4875.39	21.48		
Total	231	5136.48			

Table 29
Summary Oneway ANOVA Table for Physical Comfort By Income

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	4	148.95	37.24	.74	.57
Within Groups	213	10770.89	50.57		
Total	217	10919.84			

Table 30
Summary Oneway ANOVA Table for Functional Ability By Income

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	4	192.59	48.15	2.15	.08
Within Groups	213	4771.00	22.40		
Total	217	4963.60			

Table 31
Summary Oneway ANOVA Table for Physical Comfort By Medication Compliance

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	2	35.97	17.99	.36	.70
Within Groups	227	11360.59	50.05		
Total	229	11396.56			

Table 32
Summary Oneway ANOVA Table for Functional Ability By Medication Compliance

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	2	77.10	38.55	1.83	.16
Within Groups	227	4776.62	21.04		
Total	229	4853.72			

Table 33
Summary Oneway ANOVA Table for Physical Comfort By Exercise Compliance

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	502.93	167.64	3.40	.02
Within Groups	214	10557.45	49.33		
Total	217	11060.39			

Table 34
Summary Oneway ANOVA Table for Functional Ability By Exercise Compliance

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	60.18	20.06	.93	.43
Within Groups	214	4628.34	21.63		
Total	217	4688.52			

Table 35
Summary Oneway ANOVA Table for Functional Ability By Adaptation to RA

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of
Between Groups	3	36.70	12.23	.24	.87
Within Groups	228	11483.75	50.37		
Total	231	11520.44			

Table 36
Summary Oneway ANOVA Table for Functional Ability By Adaptation to RA

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	70.33	23.44	1.06	.37
Within Groups	228	5066.15	22.22		
Total	231	5136.48			

Table 37
Summary Oneway ANOVA Table for Physical Comfort By Practicing Relaxation

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	296.14	98.71	2.00	.12
Within Groups	227	11224.13	49.45		
Total	230	11520.27			

Table 38
Summary Oneway ANOVA Table for Functional Ability By Practicing Relaxation

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	118.77	39.59	1.79	.15
Within Groups	227	5012.67	22.08		
Total	230	5131.44			

Table 39
Summary Oneway ANOVA Table for Physical Comfort By Voluntarily Exercising

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	1296.45	432.15	9.60	.000
Within Groups	227	10223.81	45.04		
Total	230	11520.27			

Table 40
Summary Oneway ANOVA Table for Functional Ability By Voluntarily Exercising

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	549.90	183.30	9.08	.000
Within Groups	227	4581.54	20.18		
Total	230	5131.44			

Table 41
Summary Oneway ANOVA Table for Physical Comfort By Modifying Activities

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	318.10	106.03	2.15	.09
Within Groups	219	10780.29	49.23		
Total	222	11098.39			

Table 42
Summary Oneway ANOVA Table for Functional Ability By Modifying Activities

Source	D.F.	Sum of Squares	Mean Squares	F	Signif. of F
Between Groups	3	245.64	81.88	3.80	.01
Within Groups	219	4725.15	21.58		
Total	222	4970.79			

Table 43
Summary T-Test for Physical Comfort by Other Illnesses (1=Yes/2=No)

Variable		Number of Cases	Mean	Standard Deviation	T Value	D.F.	2-Tail Prob.
ADLPAIN							
	Group 1	143	20.57	6.97	0.43	229	.67
	Group 2	88	20.16	7.28			

Table 44
Summary T-Test for Functional Ability by Other Illnesses (1=Yes/2=No)

Variable		Number of Cases	Mean	Standard Deviation	T Value	D.F.	2-Tail Prob.
AIMSPF							
	Group 1	143	36.15	4.25	-0.41	229	0.67
	Group 2	88	36.41	5.43			

Table 45
Summary T-Test for Physical Comfort by Illness Severity (1=Chronic Mild/2=Chronic Moderate)

Variable		Number of Cases	Mean	Standard Deviation	T Value	D.F.	2-Tail Prob.
ADLPAIN							
	Group 1	72	19.63	7.40	-1.44	116	0.15
	Group 2	46	21.56	6.74			

Table 46
Summary T-Test for Functional Abililty by Illness Severity (1=Chronic Mild/2=Chronic Moderate)

Variable		Number of Cases	Mean	Standard Deviation	T Value	D.F.	2-Tail Prob.
AIMSPF							
	Group 1	72	35.60	4.47	-2.26	116	0.03
	Group 2	46	37.50	4.45			

APPENDIX C

FIGURES

CHARACTERISTICS OF THE SAMPLE

Figure 1. Sample by Duration of RA **(n=244)**

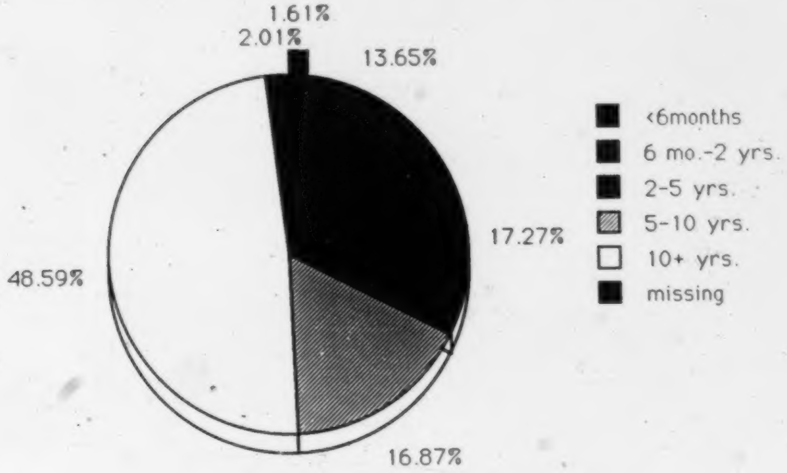


Figure 3. Sample by Marital Status **(n=244)**

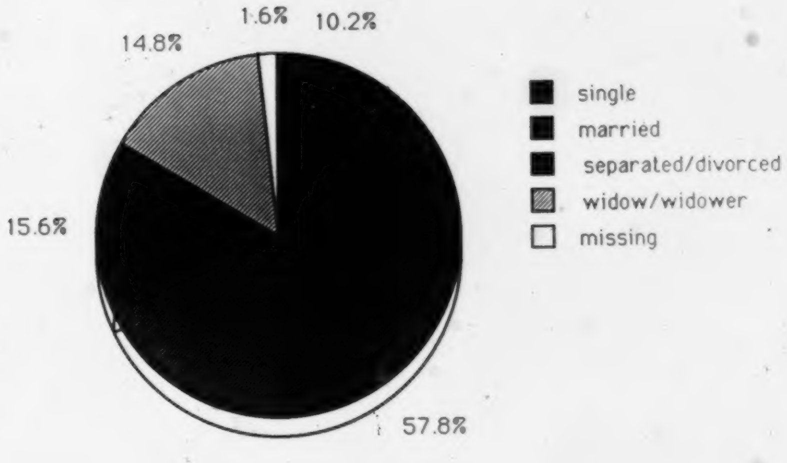


Figure 2
Sample by Age
(n=244)

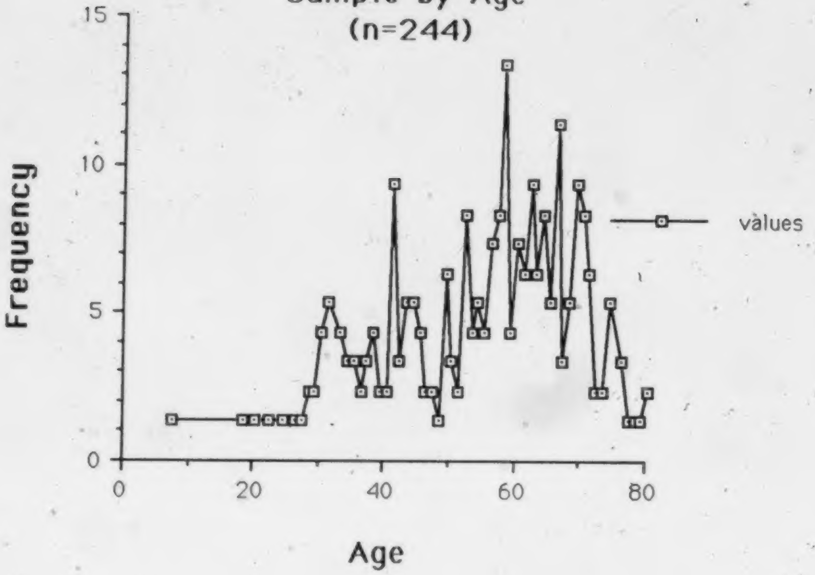


Figure 4. Sample by Educational Level **(n=244)**

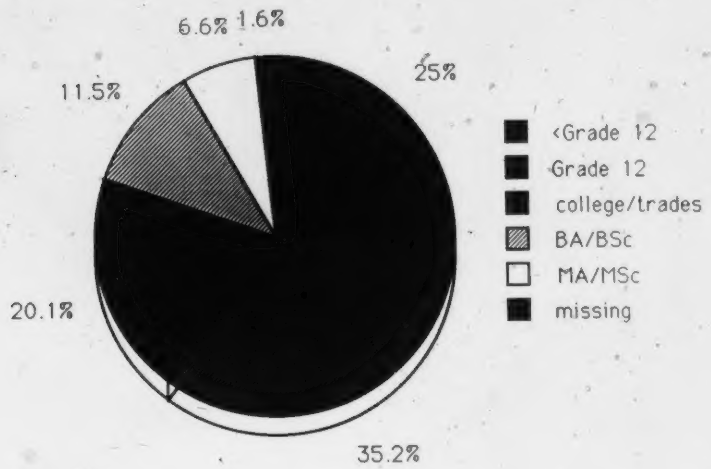


Figure 5. Sample by Income Level **(n=244)**

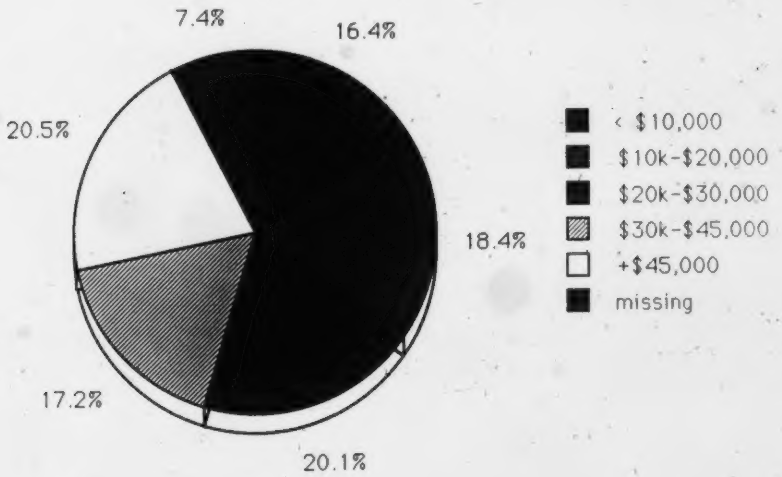


Figure 6. Sample by Other Illnesses

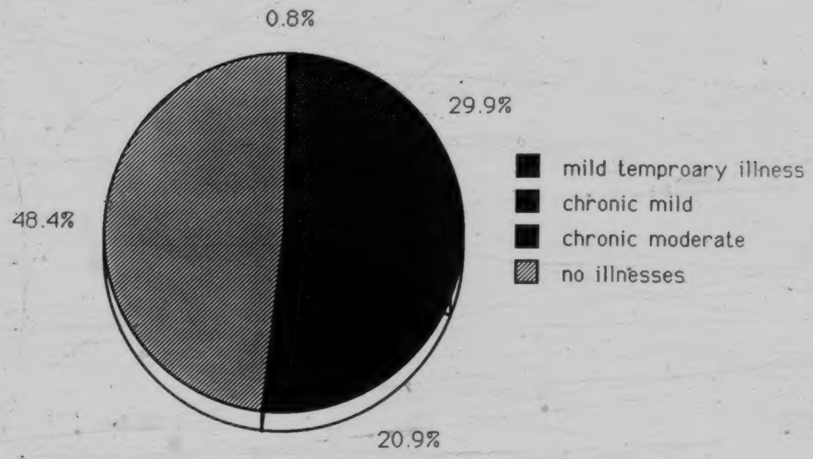


Figure 7. Sample by Coping Choice

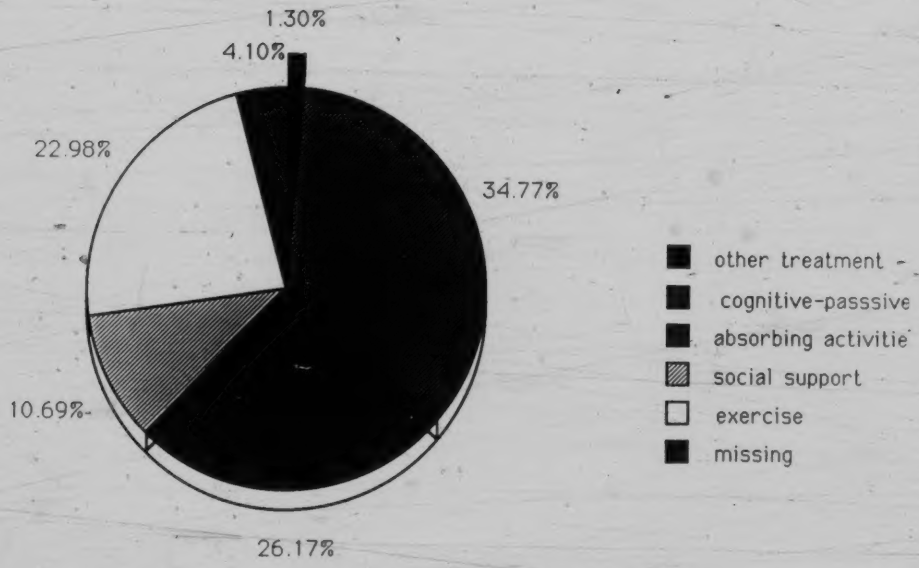


Figure 8. Sample by Medication Compliance

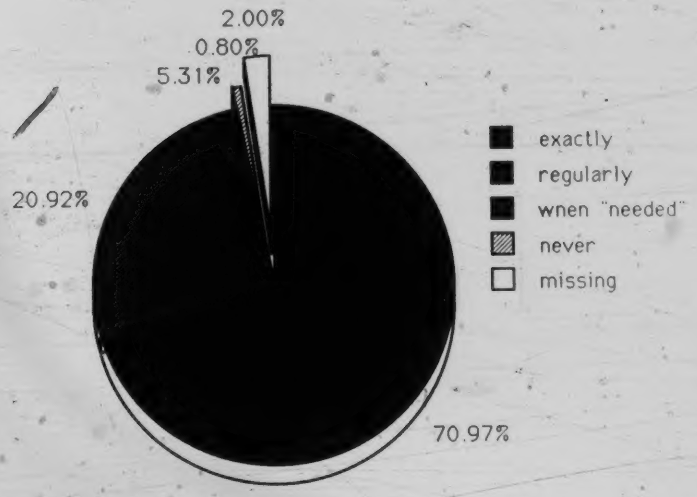
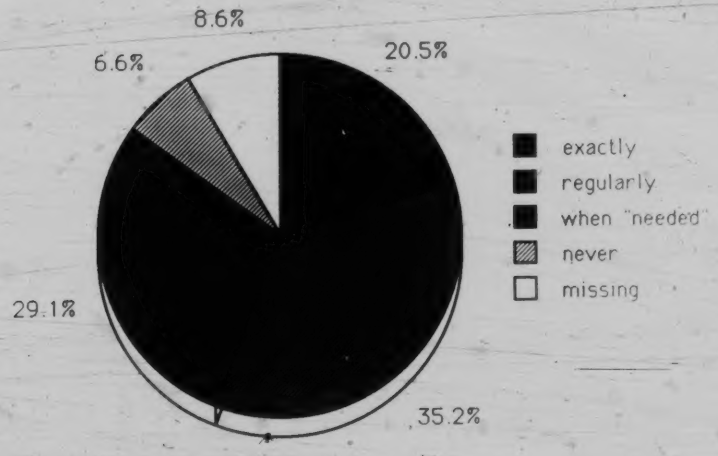


Figure 9. Sample by Exercise Compliance



APPENDIX D

ADVERTISEMENTS AND ANNOUNCEMENTS TO RECRUIT THE SAMPLE

Figure 10

Announcement: Edmonton Arthritis Association Newsletter

January and March 1989

NOTICE OF RESEARCH STUDY ON COPING WITH RHEUMATOID ARTHRITIS

Tom Strong, a doctoral student in the Department of Educational Psychology at the University of Alberta, is preparing to conduct a survey study on the coping efforts used by people affected by rheumatoid arthritis. Essentially, he is seeking volunteers who would be willing to respond to a questionnaire that would take between an hour to an hour and one half to complete. This information shall be used to inform health care providers, working with individuals having rheumatoid arthritis, of the natural strategies used by these individuals in coping with this disease. If you have been diagnosed as having rheumatoid arthritis, have not had a medication or other treatment change in the last three months, and would be willing to participate in this study, **please contact Tom Strong at 432-5205 to indicate your willingness to help out**. Information resulting from this study shall hopefully be summarized for this newsletter for publication sometime in the fall of 1989.

Figure 13

Radio Announcement: That's Living Radio Station CJCA

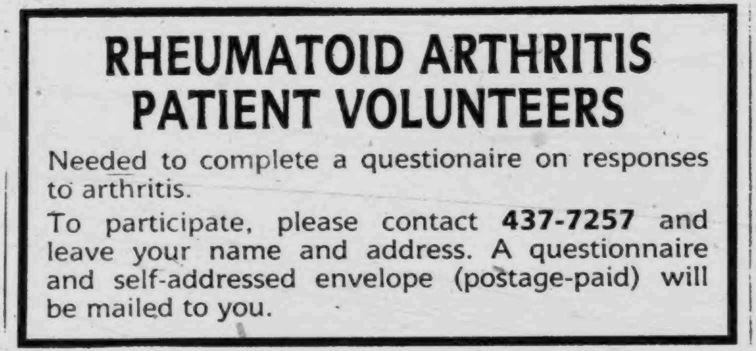
(Host: Dr. John Paterson)

May 18 & May 25, 1989

People having rheumatoid arthritis are needed to volunteer for a study of the responses they make to this illness, and how those responses relate to their well-being. Volunteering for the study involves completing a questionnaire which will be mailed to participants along with a self-addressed and postage paid envelope for its return. To participate in this study, please call 439-1365 or 432-0521 now and leave your name and address.

Figure 11

Advertisement: Edmonton Journal - May , 1989



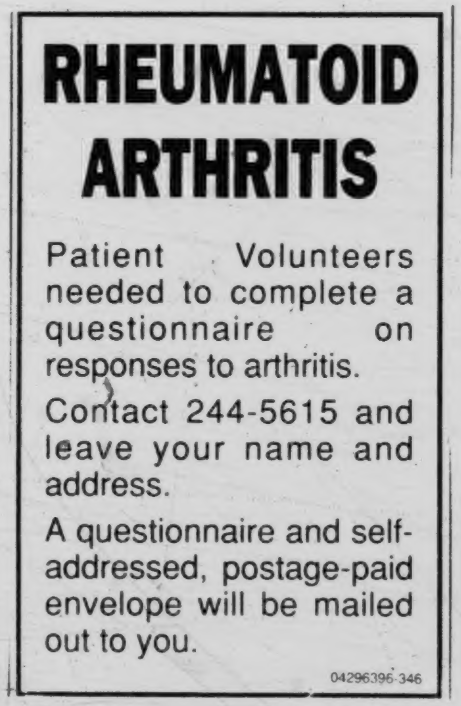
RHEUMATOID ARTHRITIS PATIENT VOLUNTEERS

Needed to complete a questionaire on responses to arthritis.

To participate, please contact **437-7257** and leave your name and address. A questionnaire and self-addressed envelope (postage-paid) will be mailed to you.

Figure 12

Advertisement: Calgary Herald May , 1989



RHEUMATOID ARTHRITIS

Patient Volunteers needed to complete a questionnaire on responses to arthritis.

Contact 244-5615 and leave your name and address.

A questionnaire and self-addressed, postage-paid envelope will be mailed out to you.

04296396-346

APPENDIX E

PERSONAL RESUME OF TOM STRONG

PERSONAL RESUME OF TOM STRONG

Thomas (Tom) Irvin Strong
Born: August 12, 1955
S.I.N. 449-212-869

Box 4492
Smithers, B.C.
V0J 2N0

EDUCATION:
- Presently a Ph.D. Candidate in Counselling Psych., U. of Alberta
- M.Ed. (Educational Counselling), University of Ottawa, 1985
- 1 yr. undergraduate counselling courses, U. of Victoria, 1983
- PDP Teacher Certification Program, Simon Fraser U., 1979
- B.A. (Political Science - History), Carleton University, 1977

PROFESSIONAL BACKGROUND

Presently	- Mental Health Therapist - Smithers Mental Health Centre, B.C. Ministry of Health, Smithers B.C.
Concurrently	- Instructor - Human Service Worker Program,
Sept'87/Aug '89	- Doctoral Intern- Student Counselling Services, U. of Alberta
Jan'87/Aug'89	- Group Facilitator- Personal Development Centre, Edmonton
Sept'87/Aug'89	- Peer Support Trainer- Alberta Alcohol & Drug Abuse Commission, Edmonton
Oct. /Dec. '87	- Group Facilitator - Catholic Social Services - Edmonton - Clareview Community Tornado Support Group
Nov. '85/Aug. '86	- Sessional Life Skills Coach - Algonquin College, Ottawa - Group counselling /academic instruction for a BJRT Program
Jan./Aug. '86	- Self-Improvement Course/Workshop Facililtator Continuing Education, Ottawa Board of Education
Apr./Sept. '85	- Addictions Counsellor/Supervisor Gateway Recovery House - Group/individual counselling of chemical-dependent males
1984/1985	- M.Ed. Student (Educational Counselling) U. of Ottawa
1981-1984	- Guidance Counsellor/Teacher Booth Memorial Jr. Secondary, Prince Rupert, B.C. (800 students/50 staff)
1979-1981	- Alternative School Teacher Prince Rupert, B.C.
Other Jobs:	- Child-care work, 7 seasons commercial fishing, lounge entertainer, cannery worker, Coast Guard deckhand

WORKSHOPS & PUBLICATIONS

- Indirect Verbal Approaches to Counselling, CACUSS Conference, Winnipeg, 1988

- Helping Clients to Value the Career Decision Making Process as a Basic Life Skill- 13th National Consultation on Vocational Counselling - Ottawa 1987

- Metaphors and Client Change in Counselling - International Journal for the Advancement of Counselling - Fall, 1989

- Book Review: Using Metaphors in Psychotherapy by Philip Barker, International Journal for the Advancement of Counselling, June 1988

- Coping and Quality of Life For Rheumatoid Patients, with R. Jevne. Manuscript to be submitted to Arthritis News

- Relationships Between Coping Beliefs, Coping Practices, Coping Resources, and Quality of Life in Rheumatoid Arthritis Patients, with R. Jevne. Manuscript in preparation.

- Indirect Counselling: A Rationale and Suggestions for Therapeutic Use. Article submitted for publication to The Canadian Journal of Counselling

- Men and Social Support. Unpublished Manuscript to be revised and submitted for publication.